DOCUMENT RESUME

ED 087 776 SP 007 764

TITLE	One Year Program to Train Developers in Public Education Systems. Final Report.
INSTITUTION	New York Univ., N.Y. Inst. of Afro-American Affairs.
SPONS AGENCY	National Center for Educational Research and Development (DHEW/OE), Washington, D.C.
BUREAU NO	BR-02-0598
PUB DATE	1 Sep 73
GRANT	OEG-0-72-1367
NOTE	126p.
EDRS PRICE	MF-$0.65 HC-$6.58
DESCRIPTORS	*Educational Development; *Educational Research; Minority Group Teachers; Models; *Professional Training; *Program Evaluation; School Involvement

ABSTRACT

The purpose of this program to train developers in public education systems was to construct and test a viable model that would fulfill its training goals in one year and which could also be replicated under similar conditions by comparable institutions. The model involved a part-time program which provided theoretical and experiential training for 15 public school educators in the role of educational developer, a role which required interpretation of ideas from educational research and implementation of these ideas in education programs. Ten of the 15 participants were members of minority groups and nine were women. The program had three major phases: an intensive 6-week workshop in methods of educational research and evaluation; a semester of classroom instruction in educational administrative leadership and the sociology of complex organizations; and a field experience in which the participants designed and implemented an innovative educational development project. Although the general feasibility of the model was validated, process and summative evaluation information suggested some desirable modifications in the model. The model could be improved by using more rigorous criteria for the selection of participants, limiting the scope of the field projects to more manageable projects, focusing more on the theory and practice of urban education, and emphasizing only those research techniques necessary for implementation of the developmental projects. (Author/DDO)

ED 087776

FINAL REPORT

Project No. RO 2-0598
Grant No. OEG 0-72-1367

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ONE YEAR PROGRAM TO TRAIN DEVELOPERS IN PUBLIC EDUCATION SYSTEMS

September 1, 1973

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

Office of Education

National Center for Educational Research and Development

New York University

Institute of Afro-American Affairs

SP 007 764

Table of Contents

	Page
PURPOSE	1
GENERAL DESIGN OF THE PROGRAM	2
Model for Training Education Developers	3
COORDINATION WITH PILOT RESEARCH TRAINING PROGRAM IN THE SCHOOL OF EDUCATION	5
INVOLVEMENT OF PUBLIC SCHOOLS	5
RECRUITMENT AND SELECTION OF PARTICIPANTS	7
PERSONNEL	11
DESCRIPTION OF PROGRAM	12
Summer Activities	12
Fall Activities	14
Spring Activities	16
Synopses of Participants' Developmental Projects	17
Instructional Techniques	21
Instructional Materials	23
EVALUATION	24
Formative Evaluation	24
Participant Input	24
Staff Input	28
Program Modification	29
Summative Evaluation	29
Participant Input	29
Staff Input	34
Outside Evaluator Input	35
Impact of Program on Participants	39
EVALUATION OF THE TRAINING MODEL AND RECOMMENDATIONS FOR THE FUTURE	40
APPENDICES	
1. Announcement of Program	48
2. Application Form	51
3. Acceptance Letter	53
Rejection Letter	54
4. List of Participants	55
5. List of Program Staff	57
6. Outline of Research Course	58
7. Outline of Sociology Course	60
8. Outline of Administrative Leadership Course	63
9. Outline of First Human Awareness Workshop	67
10. Outline of Second Human Awareness Workshop	68
11. Instructional Package	69
12. Criteria for Evaluation of Final Report	88
13. Sample Project Report - The 3M Project	89

Final Report of

The One Year Program to Train Developers in Public Education Systems

PURPOSE

The purpose of the "One Year Program to Train Developers in Public Education Systems" was to construct and test a viable model that would fulfill its training goals and also could be replicated under similar conditions by other comparable institutions.

Before training goals could be stated operationally or a program structure could be planned, it was necessary to examine the position of "developer" in public school systems in order to make an accurate assessment of a developer's functions and the skills required to perform them. It was ascertained that, traditionally, the development functions have been performed by a conglomeration of school personnel on an extemporaneous basis. Following this process, numerous educational programs have been instituted that were ill-conceived or were inappropriate for the particular schools in which they were being conducted and, therefore, were unable to fulfill their goals. Thus, the concept of the position of "developer" has grown out of a need to provide personnel to develop and implement new educational programs.

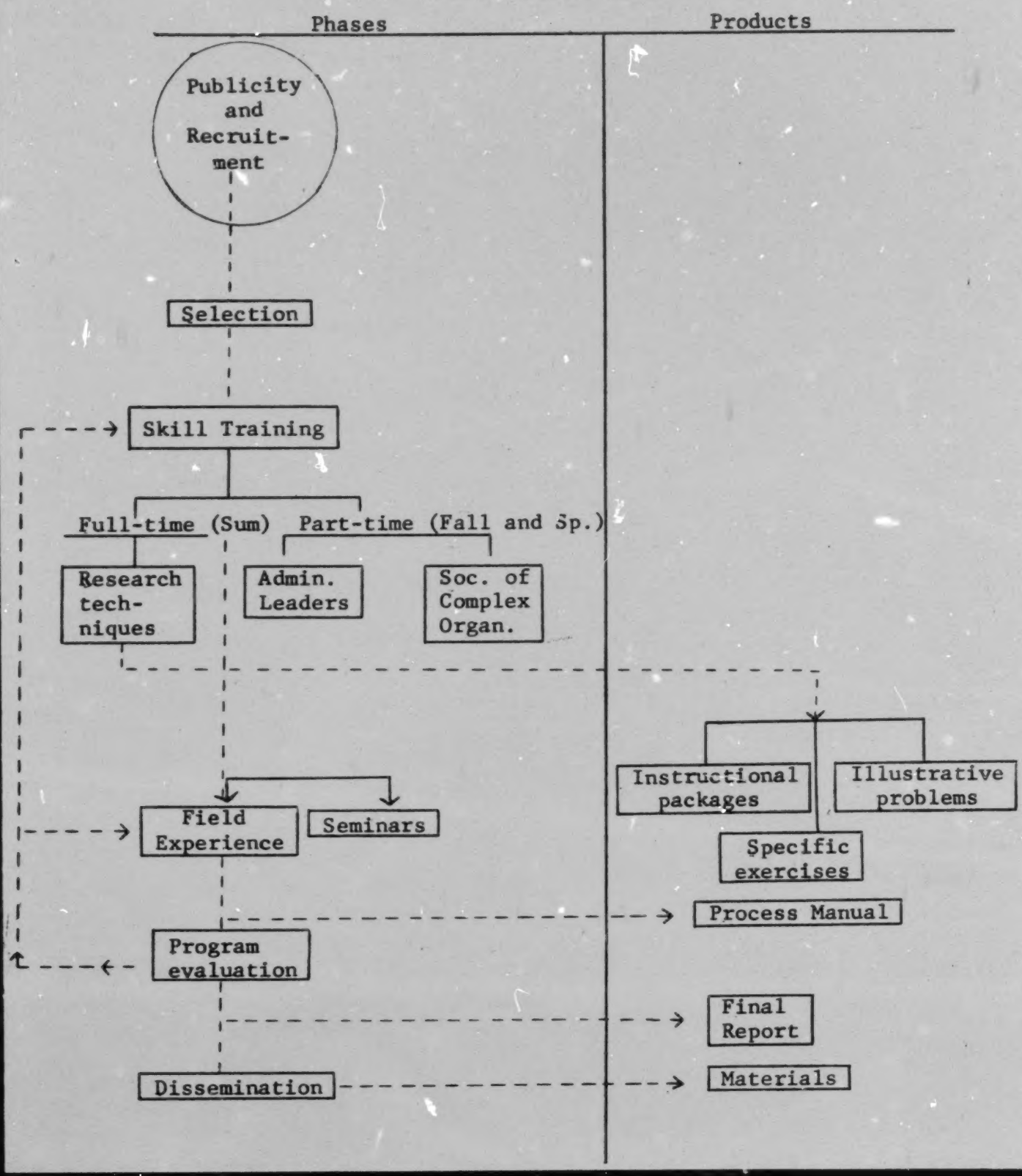
The primary objective of the program was to train qualified persons who could interpret and implement ideas derived from

educational research in the public schools. Thus, attention was given to establishing criteria for identifying "qualified" persons; to defining behavioral objectives necessary for the interpretation and implementation of educational programs, and to building a training model which could be used as a prototype for other programs to train developers.

GENERAL DESIGN OF THE PROGRAM

Fifteen public school educators, selected in cooperation with eight local school districts in New York City, participated in a full-time, intensive course in methods of research and evaluation of educational programs during the summer of 1972, carried a part-time load of academic classes during the fall term of 1972 and implemented a field project during the spring term of 1973 while working full-time within the public schools. A total of twenty graduate credits were earned in the program in the School of Education of New York University, six credits during the summer, six during the fall semester and eight during the spring semester. The academic structure of the program was designed to lead the participants through the acquisition of skills in a logical progression, and to provide an integrating field experience in educational innovation and development. A design of the model for the program is presented on page three.

MODEL
for
TRAINING EDUCATION DEVELOPERS



A calendar of activities in the program is presented below:

April, 1972	-	Program pre-planning meetings with public school administrators
May, 1972	-	Publicity and recruitment of participants
June, 1972	-	Applications for admission received and reviewed; final selection of participants and notification of acceptance of participants. Completion of organization and administration plans.
July, 1972/ August, 1972	-	Formal training in methods of research and evaluation of education programs; development of instructional materials and evaluations of formal instruction. Trainees submitted tentative designs for developmental projects.
Sept., 1972/ Jan., 1973	-	Formal training in administration and sociology. Refinement of designs for developmental projects. Workshops in human awareness/development and communication. Evaluation of formal training.
Feb., 1973/ May, 1973	-	Implementation of developmental projects. Special seminars and small group meetings for supervision of project implementation.
June, 1973	-	Trainees submitted final reports on the implementation and evaluation of developmental projects. Criteria established for evaluation of final reports. Evaluation of program by trainees. Evaluation of program by outside consultant.
July, 1973/ August 1973	-	Coordination and review of evaluation data. Preparation of final program report.

COORDINATION WITH PILOT RESEARCH TRAINING PROGRAM IN THE SCHOOL OF EDUCATION

The developers training program conducted by the Institute of Afro-American Affairs cooperated with another federally funded research training program at New York University, "A Model Pilot Program for Training Personnel to Develop Solutions to Major Educational Problems" (Grant No. OEG-0-72-1263) in the School of Education. The two programs cooperated in recruitment of participants in the same school districts and both programs emphasized using actual school problems as the basis for training.

Throughout the project various avenues were explored to facilitate access to information and resources common to problems encountered by both groups, including the sharing of staff. Formal instruction in research techniques was provided for both groups of participants during the summer of 1972. Periodically, the participants of both groups met to discuss their common problems and to work out common approaches to them.

INVOLVEMENT OF PUBLIC SCHOOLS

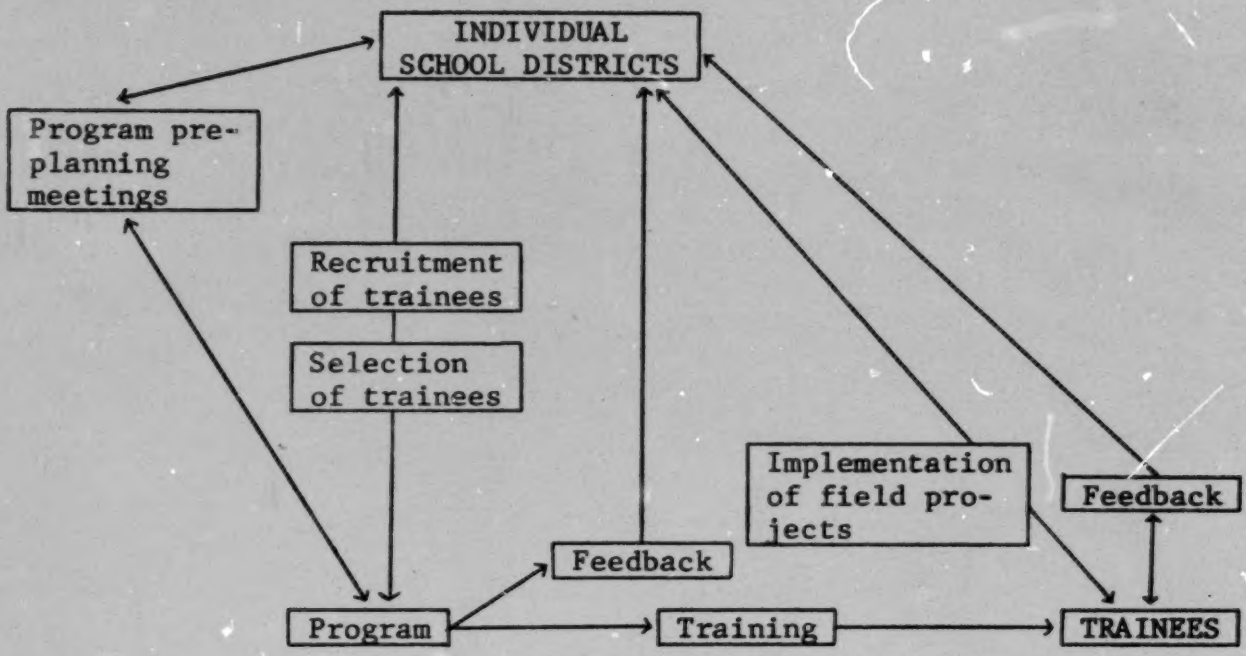
Since the practical application of interdisciplinary skills in public school systems was a high priority goal, it was deemed vital to ensure the continuing involvement

of the schools throughout the program. Therefore, pre-planning meetings were held with public school district superintendents to discuss various ways that this might be accomplished and the extent to which particular districts wished to be involved. Involvement of the public schools was maintained in several ways.

First, the Community School Districts agreed to assist in the recruitment of qualified candidates for the training program. Announcements were prepared by the staff of the Institute of Afro-American Affairs and were posted and distributed to school personnel throughout the districts. Second, public school administrators participated in the selection process through their recommendations of specific applicants to the program. Third, each school district from which trainees were selected, certified their intent to cooperate with the trainees in the implementation of field projects within the public schools of the district. Fourth, implementation of field projects in the schools by the trainees, who were full-time educators in the districts, constituted continuing involvement through utilization of personnel, participation of pupils and feedback. Finally, it is planned to make sections of this report that pertain to their district available to the participating districts. A schematic representation of the public

schools' involvement in the program is presented in the diagram that follows.

PUBLIC SCHOOL INVOLVEMENT IN PROGRAM



RECRUITMENT AND SELECTION OF PARTICIPANTS

Recruitment efforts were concentrated in the public school districts in New York City which have a heavy proportion of minority group population in the community. Initial contacts were made and appointments set up with the school district superintendents to meet with the directors of the two programs. In these meetings, the school districts were asked to disseminate information about the program and to suggest potential participants.

A printed announcement of the program was prepared and distributed by the district personnel in the schools. (See Appendix 1.)

A special effort was made to recruit Black and Puerto Rican participants since there is a noticeable sparsity of persons in these identifiable groups who presently have the training and skills to carry out the functions of an educational developer. Assistance from minority group residents and teachers working in the city schools can be very helpful in implementing research designs to see that they relate to significant problems and that research instruments are related to the interest, motivational, and cognitive levels of the participants in the studies. The availability of minority group educational researchers and developers should make such a rapprochement easier. An increase in the number of minority group researchers and developers should help to make research in the inner city more meaningful and more related to the actual problems of the schools.

The criteria for selection of the participants were a minimum requirement of a Bachelor's degree, at least two years of teaching experience, and stated interest in pursuing a research and/or innovation project in their school. Teaching experience was considered to be of vital importance so that the participants would have a reality base to supplement and

reinforce their formal academic learning and so that they would have the practical experience to execute specific educational innovations in their field experience. Consideration was also taken to selecting a group of participants equally distributed between males and females.

After the applications (see Appendix 2) were returned, they were reviewed individually by the directors of this program and the School of Education program, and tentative selections were made. Judgements were made as to whether more information was needed on a candidate or whether a personal interview was required before the final decision was made about an applicant. Several applicants were interviewed personally, further data was obtained about others, and the final selection of trainees was made at a second meeting of the directors of the two projects. Letters of acceptance or rejection were then prepared and mailed to the applicants. (See sample copies in Appendix 3.)

Although the original proposal provided for 15 participants, it was possible to include another participant within the authorized budget, and sixteen participants were initially selected. Two of the original participants, however, withdrew from the program, one during the summer session and one at the beginning of the fall semester. One of them was replaced, leaving the number of participants for the duration of the

project at fifteen. (See Appendix 4 for the list of participants.)

The sex distribution of the participants was as follows:

Male	6
Female	9
	15

The ethnic distribution of the participants was as follows:

Black	8
Puerto Rican	2
White	5
	15

The age distribution of the participants was as follows:

55 - 1		37 - 1	
47 - 1		36 - 1	
44 - 4		34 - 1	
43 - 1		33 - 1	
40 - 1		29 - 1	
39 - 1		23 - 1	median age = 39.5

The job distribution of the participants was as follows:

Teacher	6
Assistant Principal	2
Dean of Discipline	2
Executive Assistant to Community Superintendent	1
Mathematics Coordinator	1
Afro-American Culture and History Coordinator	1
Assistant to Head Teacher	1
Program Analyst	1
	15

The distribution by school district was as follows.

District 2 (Manhattan)	1
District 7 (Bronx)	3
District 8 (Bronx)	2
District 16 (Brooklyn)	1
District 18 (Brooklyn)	2
District 24 (Queens)	1
District 28 (Queens)	4
Central Board of Education	1
	15

PERSONNEL

Seven staff members conducted the program. This included the Director, Associate Director, two part-time instructors, an instructional assistant, a project assistant and one part-time secretary. (A list of program staff appears in Appendix 5.)

The Director was responsible for the planning, administration and coordination of the total program functions. In addition to these responsibilities, he taught the methods of research and evaluation course during the summer and participated in supervising the field projects of the trainees. The Associate Director contributed to the coordination of program activities. The two part-time instructors taught the courses in administrative leadership and sociology of complex organizations. The instructional assistant provided assistance in the formulation of instructional materials and field experiences. The project assistant and secretary carried out the general administrative/ clerical duties such as arranging meetings, coordinating time

and space requirements, answering correspondence, and record keeping. The project assistant also participated in evaluating and monitoring the field experiences.

DESCRIPTION OF PROGRAM

Summer Activities

From July 3 through August 11, 1972, the participants met daily, Monday through Friday, from 9:30 A.M. to 12 noon and from 1:30 P.M. to 4:00 P.M. for instruction in educational research and evaluation. A description of the course follows:

> Methods in Research and Evaluation of Education Programs
> 6 credits
>
> Basic concepts in research in education; including a consideration of types and designs of research. Emphasis on the foundations of research planning such as the nature of variables and data, statistical concepts, and sampling techniques. Various approaches are considered for collection of data and evaluation of different data collection instruments were undertaken. Data analysis and preparation of research reports is covered. In-depth examination of specific techniques and problems involved in carrying out evaluations of educational programs. Development of evaluation designs for public education programs.

(An outline of this course is presented in Appendix 6.) The morning sessions were utilized to present theoretical information in lecture/discussions while most afternoons were used by the participants to do library research, writing, or to carry out laboratory assignments in the retrieval of information through

the ERIC system or to practice skills in processing data on the New York University computer system.

Several special activities were provided for the trainees to supplement and reinforce classroom instruction. The group visited the Lockheed ERIC/Dialog Center in the Chrysler Building in New York City to observe Dialog in action and to conduct sample literature searches. A one-day trip was made to the Educational Testing Service in Princeton, New Jersey which provided an opportunity for the participants to observe the processes involved in test development and evaluation. Various staff members from different divisions of ETS met with the participants to present information about aspects of educational evaluation and test construction from their particular area of expertise, and to answer questions posed by the participants. A panel of ETS staff members discussed the theory of "culture-free" examinations and some of the difficulties encountered in their attempts to develop such examinations. A guided, instructional tour was made through the NYU academic computing center and arrangements were made for the participants to use keypunch equipment and to run pilot test data on the computer.

Culminating activities for this section of the program were: 1) a list of behavioral objectives which each participant wished to attain in this program; 2) identification and definition

of educational problems by the participants in which they wished to carry out their field experiences, and 3) tentative designs of developmental projects directed toward resolutions of the problems which they proposed to implement in their home school districts. The designs were reviewed by the Director and returned to the participants with critical comments and suggestions for improvement.

Fall Activities

The participants returned to the program on September 26, 1972. The format for this phase of the program was that the participants met once a week for two out of every three weeks from 4:00 P.M. to 8:00 P.M. for formal classroom instruction in courses in The Sociology of Complex Organizations and Administrative Leadership for Adoption of Innovation. Descriptions of the courses follow:

The Sociology of Complex Organizations
3 credits

Contemporary sociological theory and research on bureaucratic organization in education, business, and industry are covered. Emphasis placed on social setting, functional and dysfunctional aspects, power structures, decision-making, and interactive processes.

Administrative Leadership for the Adoption of Innovation
3 credits

Development of an awareness and understanding of the dynamics of planned change. Theoretical frameworks from social psychology are utilized to aid students in improving their ability to undertake leadership responsibility.

(Outlines of these courses are presented in Appendices 7 and 8.)

Every third week, the participants met with the Director and other staff members to discuss problems and progress in the development of their projects. Culminating activities for this section of the program included term papers and examinations, self and peer evaluations of leadership activities during simulations, and completed, revised designs of developmental projects.

A significant feature of this phase of the program was two Workshops in Human Awareness/Development and Communications Skills, conducted on December 1 and 2, 1972 and January 5 and 6, 1973. These workshops were conducted by the instructor of the administrative leadership course and the project assistant, both of whom have had extensive training in this field. The workshops covered areas such as interpersonal and group communication, relating to authority figures, dealing with resistance to change, cooperating and competition, and working in an unstructured environment. Although these concepts had been included in classroom discussions, prior evidence has indicated that greater

understanding and internalization of these concepts are achieved in experiential learning situations such as were provided in the workshop. (See Appendices 9 and 10 for outlines of the workshops.)

Spring Activities

During this phase of the program the participants were actively engaged in implementing their developmental projects in their home school districts. They registered and received credit in the School of Education for eight points of field experience. The course description follows:

> Field Experience
> 8 credits
>
> Concentrates on the implementation of education development designs by the participants in their respective school districts. Involves assessment of available resources and personnel, consideration of alternatives, establishment of procedures to meet goals, and an evaluation of the program. Activities conducted in cooperation with school administrators under the supervision of the Institute of Afro-American Affairs' faculty. Final reports about the project are prepared.

The total group was divided into four smaller groups for regularly scheduled meetings with the Director and other staff members to report progress and to discuss problems involved in the implementation of their projects. Designs to evaluate the achievement of the projects were also refined by the participants under the guidance of the program staff. In addition to the

regularly scheduled meetings during this phase, individual conferences were held with various participants to provide assistance in areas of difficulty experienced by the participants. The culminating activity for this phase of the program was a final written report by each individual on the development project which included evaluation data and results. A final report is attached as a sample (see Appendix 13).

Synposes of Participants' Developmental Projects

District # 2, Manhattan

Title: Mathematics Curriculum for the Open Classroom

Mathematical activity units were developed in this program for use in an open classroom situation. The units provided manipulative components for increasing levels of skill acquisition. Five elementary school teachers were trained to use this curriculum before implementation. Standardized mathematics pre and post tests were administered to measure the degree of student achievement and observations of teacher performance were instituted.

District # 7, Bronx

Title: Program to Train Elementary School Principals as Facilitators of Change

A survey of the principals' perceived need for training was undertaken throughout the school district, and a program of communications, decision-making, and other leadership skills was developed on the basis of their responses. Six elementary school principals participated in weekly training sessions for three months. Self-rating and teacher-perception rating scales were administered before and after the program to assess the effect of the training.

Title: Ethnic Studies Curriculum in Early Childhood Education

A developmental ethnic studies curriculum was constructed for grades K - 6 in Public School District 7 in New York City. Concepts, materials and lesson plans were designed for incremental progression providing reinforcement of understanding simultaneous with introduction to new information.

Title: Diagnostic and Prescriptive Reading Program

An assessment of the current school district reading programs was conducted; tests and other reading materials were rated for appropriateness, and a district-wide elementary school reading program was designed to be implemented in five pilot schools. In-service teacher and paraprofessional training programs were designed to instruct personnel in the use of diagnostic materials and individualized prescriptive approaches to teaching remedial reading.

District # 8, Bronx

Title: Reading Motivation and Achievement Through Special Industrial Arts Activities

A correlated curriculum of industrial arts activities and related materials was developed to stimulate achievement in reading. This curriculum was used in the sixth grade classes of one public school. Vocabulary retention and reading comprehension tests were administered to measure pupil achievement.

Title: Mathematics Applications Laboratory

This program supplemented the academic mathematics curriculum for four seventh grade classes. Pupils were exposed to new mathematical skills through the practical application of concepts in activities dealing with concrete situations such as measuring with a ruler, making change for purchases, etc. Laboratory hardware was provided through a "one-time offer" mini-grant. Pre and post tests were administered to measure mathematics achievement.

District # 16, Brooklyn

Title: Teacher Training and Utilization of Techniques to Reduce Behavior Problems in the Classroom

Six elementary school teachers were given training in the use of techniques to modify behavior through operant conditioning. These techniques were utilized in their daily classroom performance and data was gathered concerning their effectiveness through observations of behavior of specific children over a period of three months.

District # 18, Brooklyn

Title: Career Information Program as a Retention of Potential Drop-outs in the Junior High School

This program involved a junior high school class, selected according to predetermined criteria as having a high percentage of potential drop-outs. The regular curriculum was supplemented with information concerning specific careers and was followed by trips to the sites of the professions that were studied. Pre and post tests were administered to the class to assess interest in these careers and knowledge about entry skill requirements.

Title: Individualized Instruction in Vocational Health Careers Training Program

Individualized instructional packages in health care were developed and used in a class of low achievers in a vocational high school. Pictures, illustrations and simple vocabulary were employed to alleviate the difficulties of low reading ability of the students. Students were given competency-based examinations before and after use of these packages.

District # 24, Queens

Title: Parental Involvement in Elementary School Bi-lingual Program

Ten parents of children in a bi-lingual program volunteered to spend two hours per week for three months in the classroom to provide cultural enrichment activities. Teacher and parent opinion surveys and classroom observations were conducted to gather data on the perceived effectiveness of the program.

District # 28, Queens

Title: A Program of Student Participation in School Discipline Policy-Making and Implementation

Fifty junior high school students were selected to participate in the development of a discipline policy for their school. When the policy was established, these students were given orientation and training to perform as monitors to assist in carrying out the discipline policy. Data was collected over a five month period about the number of discipline referrals during this program and compared with the same period for the previous year. A survey of teacher perception and opinion of the effectiveness of the program was also conducted.

Title: Special Activities Program for Disruptive Children in the Elementary School

A program of individualized learning and motivational activities was developed and administered in a special area for disruptive children who had been removed from their classrooms and referred to the Guidance Department. Individual logs were maintained for each child serviced in the program and data was collected concerning the incidence of referrals by class and per child serviced.

Title: Teaching Reading Through Content Subjects

Intermediate school science supervisors and teachers were trained in methods of teaching reading skills through their subject area. Experimental and control sixth grade classes were compared for understanding of concepts and science vocabulary after four months.

New York City Board of Education

Title: Evaluation of Occupational Skills Program

This project involved the development and implementation of an evaluation model for the New York City Occupational Skills Program. Survey instruments were constructed and information was collected from students, parents, teachers, and industry representatives. Assessment data was processed and inferences were made concerning the effectiveness of the program.

Instructional Techniques

It was recognized and accepted that the participants were a diverse group who, as individuals, could learn and achieve by different means. Furthermore, the various skills and concepts that were conveyed throughout the program required different approaches for the most expeditious acquisition. Therefore,

diverse teaching techniques were employed to create learning experiences to achieve these goals. The following techniques were employed in one or more of the program components:

Lectures - theoretical material in educational research, school administration and complex organizations was presented in traditional lectures.

Discussions - scheduled periods of time were used for directed exchanges of ideas and clarification of concepts.

Audio-visual presentations - supplemented lectures and discussions in test construction, use of charts and graphs, and interviewing techniques.

Programmed instruction - used for review and reinforcement of statistical skills.

Simulations - administrative and program management "games" were played using a variety of maneuvers.

Role-playing - provided practice in interviewing and negotiating skills.

Workshops - communication and leadership skills were developed in interactional workshops.

Small group seminars - offered the participants opportunities to share expertise and cooperate on common problems.

Laboratory applications - experiences were provided in which participants practice mechanical skills in electronic data processing, retrieval of information from the ERIC Dialog, and a field trip to a test development center.

Independent work - participants designed and implemented educational projects, under staff guidance, which required synthesis and application of theory in practice.

Instructional Materials

Throughout the program, various instructional materials were developed by the program staff. Other material, appropriate to the training goals, was selected from available sources within the University and from other RDD&E projects. The entire instructional package is presented in Appendix 11. A list of materials used in the program follows:

(1) Role of Developer - operational definition - function and responsibilities
(2) Flow chart for developers
(3) Differences between educational research and educational evaluation approach to problem
(4) Guidelines for planning research
(5) Search Procedure Form
(6) Bibliographical Abstract
(7) Retrieval of information module - Far West Regional Laboratory ER&D (used intact)
(8) Role and function of the ERIC Thesaurus in Education and ERIC terminology (used intact from ERIC Thesaurus)

(9) Research interview module - Cornell University (used intact)
(10) Programmed instruction statistics kit - New York University (used intact)
(11) Simulations in educational situations - Developmental Digest (used intact)
(12) Suggested outline for developmental proposals

EVALUATION

Formative Evaluation

Various procedures were implemented throughout the program to collect data so that appropriate modifications could be made in the objectives and instructional approaches in order to facilitate the learning process and to refine the structural model. These procedures were designed to gather data from the participants as well as from the program staff.

Participant Input

After initial instruction during the summer course in the need for, and the methods of, stating behavioral objectives in the development of educational programs, each participant was asked to state his or her behavioral objectives in this program. This assignment provided an assessment of their ability to state objectives in behavioral terms, and also provided data for comparison with the behavioral objectives that had been established by the program staff. Careful scrutiny of this

information indicated that all the participants' behavioral objectives coincided with some of the program objectives, but did not include the entire range of program objectives.

In order to obtain some guides to the participants' perception of the effectiveness of the learning experiences and teaching techniques in meeting the program's objectives, further data were elicited through the use of a rating scale and questionnaire. This instrument which requested the participants to rate the summer research course on several components and to suggest recommendations for improvement of this section, was administered at the end of the intensive summer workshop. A summary of their responses and recommendations follow:

	Highest Rating				Lowest Rating
	5	4	3	2	1
1. Was this course of value to you?	7	7	1	-	-
2. Were the topics included in the course presented clearly?	3	7	5	-	-
3. Were the assignments of value to you?	8	6	1	-	-
4. Was the text of assistance to you?	-	2	7	4	2
5. How would you rate the organization of the course?	2	7	6	-	-
6. To what extent did the course meet your expectations?	7	7	1	-	-

N = 15

On the same instrument, the participants were asked to indicate which of the summer assignments had been most helpful to them; to recommend improvements for the course, and to make any other comments that they wished about this learning experience. Their responses were tabulated, and are given in summary below:

Most Helpful Assignments	No.
Conceptualization of research/ developmental model	6
ERIC/Dialog	5
Definition of problem	5
Visit to ETS	4
Data processing exercises	2
Writing a proposal	1
All assignments	1

Recommendations to improve course	
More help through individual conferences	5
More structure/organization	4
Spend more time on statistics	3
Use more practical/concise interviewing models	2
More/clearer instruction in data processing skills	2
More demonstrations of skills such as ERIC Dialog and data processing	1
More specific outlines on writing of program proposals	1
More time on definition of problem	1
More assistance in developing research instruments	1
Do not assume trainees have research skills	1

Additional responses (individual comments)

Good introduction to ERIC Dialog
Emphasis upon analysis (of educational problems) good
Class lectures and demonstrations were stimulating
Good feeling of group unity and friendly atmosphere
Helped me to formalize educational problems (i.e., identify components and organize procedures necessary for resolution)
Course opened a new area of educational involvement for me
Course presentation excellent
Need more screening of participants to select dedicated people
Need more and longer sessions for lecture and discussions
Participants should be public school district coordinators, not teachers, because coordinators are in a better position to implement programs
Data processing exercises were frustrating
Data processing exercises were interesting but were presented too early in program
Question value of data processing assignments
Should pair developer and research trainees to work on same problem
Most of assignments led to frustration and sense of incompleteness about discussions and skills
Prefer learning by positive rather than negative reinforcement

In examining these responses, several factors appeared which offered guidelines in the formative evaluation of the program. First, it seemed that the trainees found assignments that dealt with specific, practical skills to be most helpful. Nonetheless, they recommended more instruction, including more specific demonstrations and/or individual help in the acquisition of these skills. The fact that none of the participants found the theory of educational research and evaluation to be most helpful may be related to their seeming difficulty in translating theory into application and their expressed need for more specific demonstrations and individual help, or to their orientation to more practical considerations.

Staff Input

Several procedures were used by the staff to assess the progress of the participants in order to identify those areas in which they seemed to be having difficulty and those areas in which they seemed to have acquired adequate proficiency. In order to diagnose the participants' facility in the use of research techniques, several tasks were designed and assigned by the staff through which the participants could demonstrate their level of proficiency. For example, periodic quizzes were given

in statistical techniques, sample data were transferred to punch cards, systems/control cards were prepared and correlations and t-tests were run on an IBM 360 computer, and simple research instruments such as rating scales and interview schedules were constructed.

Program Modification

Based upon responses from the participants and staff evaluation of various assignments and activities, several modifications were made in the plans for the program activities during the academic year. Perhaps the most major revision was the change in the fall class schedule so that every third week of class time was used to assist the participants in shaping their developmental designs. Other modifications included the formalization of arrangements for individual conferences with staff members to review and reinforce research and evaluation skills, opportunities for additional informal interactions with the participants in the Model Research Training Program in the School of Education, and the addition of the human awareness and communication workshops.

Summative Evaluation

Participant Input

The same course evaluation instrument that was administered to the participants at the end of the summer session was

readministered at the end of the program in June 1973. The participants were asked to complete one for each of the formal courses in the program; i.e., Methods in Research and Evaluation in Educational Programs (the summer course), Sociology of Complex Organizations and Administrative Leadership for the Adoption of Innovation (the fall courses). Their responses were tabulated and two comparisons were made. First, the ratings of the summer research course which had been given in August, 1972 were compared to the ratings of this course in June, 1973 after the participants had designed and implemented their projects. The results are listed below:

	Highest Rating Summer/Spring '72	'73	Average Rating Summer/Spring '72	'73	Lowest Rating Summer/Spring '72	'73
1. Was this course of value to you?	14	12	1	3	0	0
2. Were the topics included in the course presented clearly?	10	9	5	6	0	0
3. Were the assignments of value to you?	14	11	1	4	0	0
4. Was the text of assistance to you?	2	6	7	5	6	4
5. How would you rate the organization of the course?	9	11	6	4	0	0
6. To what extent did the course meet your expectations?	14	10	1	5	0	0

The rating of the research course experience declined somewhat from the summer of 1972 to June, 1973. This is probably due to the fact that the students' perceptions of their need for research skills sharpened during the year because of their field experience and as a result their expectations of the research course were higher. Thus, they rated the course slightly lower in June, 1973 than they had at the end of their initial experience in the summer of 1972 when their insights into the need for skill in research techniques were more limited.

Second, the June, 1972 ratings for the three courses were compared to each other as shown below:

	Highest Rating	Avg. Rating	Lowest Rating
1. Was this course of value to you?			
Research	12	3	0
Administration	11	4	0
Sociology	9	5	1
2. Were the topics included in the course presented clearly?			
Research	9	6	0
Administration	7	7	1
Sociology	10	4	1
3. Were the assignments of value to you?			
Research	11	4	0
Administration	8	6	1
Sociology	9	4	2
4. Was the text of assistance to you?			
Research	6	5	4
Administration	7	5	3
Sociology	7	4	4
5. How would you rate the organization of the course?			
Research	11	4	0
Administration	10	3	2
Sociology	12	2	1
6. To what extent did the course meet your expectations?			
Research	10	5	0
Administration	9	4	2
Sociology	7	5	3

While the sociology course was rated somewhat higher than the other two courses in clarity of presentation and organization; the research and administrative leadership courses were rated by the participants as being somewhat more valuable.

The participants were also asked to list the ten skills that they believed to be most essential to function as an educational developer and to indicate whether or not they felt that these skills had been covered in the program. They were also asked to rate themselves on their competency in the skills that they had listed. The results of this inquiry are presented below:

	# indicated essential to developers' role	Covered in program	Competent; good grasp of concepts	Need more training or practice
1. Human relations skills	15	14	12	3
2. Research techniques	14	13	7	7
3. Ability to design programs and evaluations	14	12	6	8
4. Ability to define problem	12	12	11	1
5. Locating research information	11	10	9	2

The five skills most frequently mentioned as essential to the position of developer were: (1) human relations skills, (2 & 3, tie) ability to design programs and evaluations, and research techniques, (4) ability to define a problem, and (5) locating research information. Most participants indicated that these skills were covered in the program, but over half of the group felt they needed more training or practice in the areas of program design and evaluation, and in research techniques.

Finally, the participants were asked to indicate which of the ten skills that they had listed they actually used in their professional capacities. A summary of their responses is as follows:

Skill	No.
Ability to design program or evaluation of program	14
Human relations skills	9
Ability to define problem	6
Writing skills	6
Ability to locate research information	5
Research/evaluation techniques	5
Data analysis/statistics	4
Ability to implement project/research/evaluation	4
Organization and management skills	4
Ability to analyze system	3
Ability to affect change	3

The skill of designing and evaluating educational programs is used by practically all of the participants. It is interesting to note that human relations skills was the only other skill that was used by over half of the participants. Many of the other skills are actually research skills which, if clustered together, would be used by practically the entire group.

Staff Input

The academic work of the participants in the classroom and related assignments were evaluated by the staff according to standards required in graduate level courses in the School of Education at New York University. Grades covered the usual range from A to C. Some sample comments reflecting the range of individual performance by faculty members are:

> Brought up main perceptive points in class which reflected an understanding and interest in the subject matter. Able to draw well from theoretical points to specific situation in her school.
>
> This is a very good paper which presented a great deal of material and reflected a lot of hard work. Deductions from the material were well made and reflected an understanding of issues.
>
> An adequate, although not outstanding, piece of work which reflected an absorption of the course's material but not an expansion of its implications.

Specific criteria were established for the evaluation of the participants' final reports on their developmental projects. To

develop these criteria, the six major components of the final program report were identified, and then descriptors were written to guide the assignment of ratings on a ten point scale. (See Appendix 12 for rating scale.) Because the program staff had been working closely with the participants in the development of their project designs and implementation of their projects, the staff was thoroughly familiar with the individual projects. The Director and Project Assistant read and evaluated each report independently. The two sets of ratings were averaged and alphabetical grades were agreed upon to correspond to numerical ratings. The project evaluations resulted in a range of 3.7 to 8.0 (on a ten point scale), with an average score of 6.3. Thus, the project reports were rated as only fair on the average. Given the variations in background and experience of the participants, it is probably an accurate portrayal of the participants' performance at this time.

Outside Evaluator Input

Dr. Doxey Wilkerson of Mediax Associates, Inc., reviewed the program in an on-site visit in July, 1973. After examining

the proposal, progress reports, instructional outlines and materials, participants' project outlines and reports, he made the following general evaluation:

Impression

> My overall assessment of the program is strongly positive. First, it is addressed to an important need -- that of personnel, especially minority-group educators, who are theoretically and technically equipped to effect progressive changes in the public schools. Second, the main components of the program -- methods of research, organization development (including interpersonal relations), and field experiences -- seem appropriate (but perhaps not fully adequate) for the training of such personnel. Third, it appears that, for the most part, the program was effectively organized and implemented. Fourth, participants' final project reports, although not of high quality, do suggest that a valuable learning experience was here involved, an impression buttressed by their formal appraisals of the several components of the program.
>
> I would certainly recommend continued development of the program, with some modifications in the light of this first year's experience.

In addition, he made the following suggestions for future programs:

> First, during full-time summer study, give major emphasis to theory and practice in urban education, with a focus on recent 'innovative' programs and related research evaluations.

On the one hand, this would entail the examination of a wide range of innovative practices in urban education and an appraisal of the varying theoretical premises from which they stem. Such a learning experience -- a course in 'Innovations in Education' -- was anticipated in the Proposal for the fall semester, but was not actualized. Its need seems inherent in the general goal of the program.

On the other hand, full-time summer study would involve examination of research evaluations of innovative programs, with assessment of their underlying assumptions, methods, and findings. Experiences in this area would seek to develop mastery of related concepts and methods in research and statistics.

Behavioral objectives would include, much as during 1972-73, identification of an innovative project to be undertaken, validation of this project selection in the light of theory and practice in the field, and a tentative design for implementation of the project, including a plan for research evaluation.

Second, during part-time study in the fall semester, give major emphasis to theory and practice in effecting change in educational organizations, approached through such sources and workshops as were used during 1972-73, with a focus on implications for the particular innovative projects selected by individual participants. Continue during this semester the study of research and statistics, with emphasis on basic 'tool' concepts and approaches and on the specific requirements of research and evaluation in the projects selected by different participants. Among the behavioral objectives of this semester's work, again as during 1972-73, would be a revised and completed design for the innovative project.

> Third, as during the past academic year, devote the spring semester mainly to implementation of the selected project in the field and to preparation of the final report. Also, continue systematic study of theory and practice in organization development and in research evaluation, with emphasis on applications to the several field projects in process.
>
> The main implications of these suggestions are: (a) increased emphasis on theory and practice in urban education, in the initial segment of the program; (b) limitation in the scope of learning objectives in the area of research and statistics, and extension of instruction in that area throughout the period of the program; (c) adaption of instruction in all areas to further the goal of innovation in school practice; and (d) considerable individual instruction, especially during the fall and spring semesters. It is probable that some of the measures here outlined would involve no substantial change from 1972-73 practice.

The following comments summarize his general evaluation of the training model used in this project:

> Finally a comment on the training model represented by this program.
>
> Experience during 1972-73 suggests approaches toward improved implementation of the model, such as more rigorous criteria for the selection of participants, field projects of more limited scope, continual adaption of instruction to the varying requirements of individual participant's projects, formative evaluations, and others.
>
> More fundamentally, my limited study of the program suggests the need for some modification in the emphasis and structure of the model

> itself. First, the period of full-time summer study should include a substantial component for the systematic study of theory and practice in urban education, with a focus on innovative practices and their evaluations during the past decade. Second, the research-and-statistics component should seek much more limited goals, restricted to 'tool' concepts and methods essential for understanding and implementing evaluations of innovative projects; and it should be developed throughout the year, with a continuing focus on applications to research evaluation.

Impact of Program on Participants

In order to determine the overall impact of the program on participants during the project, a questionnaire was administered to the participants at the final meeting of the group in June, 1973. Information was gathered on the positions held by the participants when they entered this program and their positions at the end of the program. Comparisons were made to determine if changes in positions had occurred and if so, whether it was a lateral change in position status or a promotional change. Data were also obtained as to whether the participants were matriculated for a graduate degree when they entered the program, or whether they planned to matriculate for a graduate degree at the end of the program.

Of the fifteen participants, three had changes in positions which constituted promotions, and one will assume a new position in September 1973 which will constitute a promotion. At the

beginning of the program, four participants were matriculated in a graduate degree program in some college or university; eleven were not. At the end of the program, eight of these latter eleven indicated that they planned to matriculate for a higher degree. Of course, no claims of causality can be made between participation in this program and the above data and none are intended. However, the information obtained does present a picture of a group of educationally and professionally upward mobile people, and such people are crucial to RDD&E endeavors. Finally, it should be noted that twelve of the participants indicated that the performance of their positions required the use of skills obtained in this program, and three indicated that partial use of skills obtained in this program was required by their positions.

EVALUATION OF THE TRAINING MODEL AND RECOMMENDATIONS FOR THE FUTURE

In making a summative evaluation of the training program we should <u>first</u> begin with an identification of the type of skills needed by an educational developer in public school settings. The following skills were used as the focus of this program:

(1) diagnosis of an educational problem
(2) negotiation of possible solutions to educational problems with teachers, paraprofessionals, administrators and community representatives

(3) identification of relevant research on the problem and interpretation of that research
(4) implementation of possible solutions, including various administrative problems involved in the solutions
(5) evaluation -- the ability to identify relevant data to be used in formative and summative evaluation, ability to collect such data, and ability to analyze and interpret the data.

The second aspect of the evaluation of this training program involves the criteria and procedures for selecting participants in the program. Some of the participants in the current program might have been served better if they were involved in a program which was not as demanding. In order to obtain participants who are maximally interested and prepared to benefit from training as a developer, it is recommended that the following criteria be used to select participants for a research training program that emphasizes public school problems:

(1) Writing skills. It is imperative that the participants have basic skills in effective written communication. It is possible to screen for these skills by having each prospective participant write a three or four page summary in which he or she presents a solution to a simulation of an educational problem which will be presented as part of the entrance application.

(2) Interest in using research to solve educational problems. This could also be ascertained through the aforementioned three or four page statement.

(3) Reasoning ability. Problem solving involves a considerable amount of reasoning. It would be possible to assess the candidate's reasoning ability through the written resolution to the simulated

problem that he has prepared when he applied for the program, as well as through a subsequent interview.

(4) Experience. A review of the candidate's actual experience in solving or attempting to solve or participating in various educational programs is essential.

(5) Educational record. The intent here would not be to look for a particular grade point average, but rather to look at the candidate's performance in specific courses. For example, a candidate who had done very poorly in English or in mathematics is not a particularly good bet for a program where he would have to do some writing and some statistical analysis.

After data are collected on candidates for the program, the staff should rate each candidate on a ten point scale for each of the above criteria and, thus, arrive at a rank order for the prospective candidates. Recognizing that many people apply for programs in which they do not intend to follow up, it is probable that some candidates who rank high on the list will decide not to participate in the program and candidates lower on the list should be considered. If the remaining candidates who are interested in the program are rated too low, it is suggested that an additional group of candidates be identified for further screening. Since such a procedure is apt to be time consuming, it is suggested that more lead time than was provided in this project (approximately five weeks) be provided for the selection of participants.

The third area to be considered in evaluation of the

training program involves the various instructional experiences used in the program. While a variety of experiences were provided, ranging from formal lecture-discussion classes to field experiences in projects, it is our feeling that certain types of experiences were more beneficial than others.

The field trips to the Educational Testing Service in Princeton and the Lockheed Information Services Terminal in the Chrysler Buidling to make sample ERIC literature searches were rated highly by the participants. The candidates also benefited greatly from the human awareness/development sessions. These experiences helped the participants to feel free in confronting and relating to authority figures. Since some of the participants had worked in authoritarian atmospheres, they felt hesitant to challenge any authority figure, including staff members of the project whom they viewed as having some power.

The participants indicated that the courses in the sociology of complex organizations and administrative leadership for making innovations in the educational setting were very useful to them. It is possible that these two areas could be combined into one course using a case study approach to integrate the two areas.

Certain areas, such as statistics, were not covered

adequately. Since statistics is a very important and specific aspect of research and evaluation, it is probably necessary to spend more instructional time on the acquisition of basic statistical concepts, such as central tendency variability, correlation, and statistical inference than was provided in this program. We feel that more specific instruction should be given about basic statistical concepts and computations. We recommend that programmed statistics materials used in the program be supplemented by laboratory periods involving the computer. While an experience with the computer IBM 360-40 was provided for the participants in the workshop, we feel that this experience should have been more directly related to the statistics being taught.

Another consideration has to do with the amount of time provided for instruction. In this program the participants attended full time during the summer session for six weeks and then once a week for the balance of the 30 weeks of the school year. This was appealing because it made it possible for students to gain certain basic skills in intensive instruction during the summer and then for them to apply the skills throughout the school year. Unfortunately the students were not able to gain sufficient research skills in the summer program to deal effectively with the type of evaluation

and data collection problems that they faced in their project during the school year. In the future, it is recommended that instruction on research techniques be continued throughout the school year while the participants are attending as part-time students.

The type of terminal activity expected of the participants should be reconsidered. The terminal activity in this project was the implementation of a developmental program of purported district-wide significance and the preparation of a report about the program including a detailed evaluation of the project. A terminal activity of this magnitude proved to be too difficult for most of the students due to deficiencies in writing skills, and data collection and analysis skills. It is, therefore, recommended that a pilot learning activity be included in the program at the end of the summer session. The students could work on a project of limited scope in which they would be expected to present a detailed written report with appropriate data for review by the entire class as well as by the project staff at the end of the summer. With this experience behind them, it is our belief that the participants might improve their final project. The terminal activity should be limited to a project that is more manageable given the skills and responsibilities of the participants.

The final aspect of this evaluation is concerned with an assessment of the viability of the current model for training research and development personnel, a model which emphasizes using public school problems as the focus of the training. It is our belief that viable research and development training programs can be conducted within the context of the public schools, but these programs must have a more limited focus than we had in our program. Given the public schools, it is unrealistic to expect staff members to be able to solve major educational problems while obtaining research and development training. It would be more realistic to expect participants in a research and development training program to carry out a project of limited magnitude, possibly involving one school, or maybe even one class, rather than to expect them to attempt to solve problems of district-wide significance at the same time as they are getting their training.

As far as the viability of the model in attracting and training minorities to research and development, we believe the model has excellent possibilities. In many of the school districts a goodly number of the personnel and many of the pupils are persons of minority background. Thus, there is good potential in capitalizing on the interests of minority

teachers and administrators by using a problem centered approach to interest and train them in research and development.

In summary, the training model in this program can be an effective way of training educational development personnel. The model can be improved by more rigorous criteria for selection of participants, limiting the scope of the field projects, limiting the research techniques component to those skills immediately needed by the participants and by providing for a more systematic study of the theory and practice of urban education. With these modifications, the model used in this program should be an extremely useful method of training additional research and development specialists and also of increasing the number of minority personnel in educational research and development.

Appendix 1

A ONE YEAR PROGRAM TO TRAIN DEVELOPERS
IN PUBLIC EDUCATION SYSTEMS

July, 1972 - May, 1973

New York University
Washington Square
New York, New York

Supported by the United States Office of
Education under a grant from the National
Center for Research and Development

I. PROGRAM

For teachers, curriculum directors, project coordinators and others involved in refining the educational process, this program will offer a comprehensive preparation for the role educational developer (the person who translates research ideas into action). The program will begin with formal classes in educational research techniques in an intensive six-week workshop during the summer of 1972. This course will consider basic concepts in research in education, including foundations of research planning, data collection techniques and analysis of data. During the 1972-3 academic year, the participants will attend part-time to take formal classes in communications, innovations and evaluation in education. The course in communications is designed to study the scope and methods of communication in public education systems; the course in innovations will present an inclusive survey of innovative techniques and programs in all levels of public education, and the course in evaluation will provide an indepth examination of specific techniques and problems involved in carrying out evaluations of educational programs. Special emphasis will be placed upon the relationship of all the procedures covered in the formal classes to the objectives and to community participation in the development of educational programs. During the field experiences which will be provided in the spring semester, 1972,73 each student will have the opportunity to be engaged in the actual process of developing an educational program to meet an identified need in an urban school setting in order to become aware of the practical problems involved in such an endeavor. Twenty points of graduate credit in the School of Education of NYU can be earned in this program.

II. QUALIFICATIONS FOR APPLICANTS

The Institute of Afro-American Affairs is seeking applicants who have a bachelor's degree and at least three years of teaching experience.

III. STIPENDS, ALLOWANCES AND BENEFITS

Stipends are $75 per week and $25 per dependent during the summer session. Tutition charges are waived. Transportation expenses of $10 per week will be reimbursed during the academic year. Housing and meal plans may be obtained at a minimum cost in University residence halls.

IV. FACILITIES

The regular academic and library facilities of New York University will be available to participants.

Institute Staff

Roscoe C. Brown, Jr., Ph.D.	Director
LaMar P. Miller, Ph.D.	Education Director
Louise A. Baggot	Special Assistant for Research

Lecturers in Statistics, Innovations and Communications

This program is in compliance with Title VI of the Civil Rights Act of 1964, which states: "No person shall, on the basis of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

* * * * * * * * * * * * * * *

If interested, tear off and return by mail to:

Professor Roscoe C. Brown, Jr.,
Director
Research Developers Institute
Institute of Afro-American Affairs
New York University
10 Washington Place, 5th floor
New York, New York 10003

_____Yes, I am interested. Please send me an application.

NAME _____

ADDRESS _____

_____

NO. OF YEARS TEACHING EXPERIENCE _____

New York University

Institute of Afro-American Affairs

10 Washington Place, Room 500
New York, N.Y. 10003
Telephone: (212) 598-7095

Appendix 2

APPLICATION FOR ONE YEAR PROGRAM TO TRAIN
DEVELOPERS IN PUBLIC EDUCATION SYSTEMS

1. Applicants full name: Mr. / Miss / Mrs. _____ Last (Family) First Middle Initial

2. Permanent home address
Street _____
City _____ State _____ Zip Code _____

Telephone: Area Code _____ Home Telephone _____ Business Telephone _____

3. Date of birth: _____

4. Marital Status: ___Married ___Divorced ___Single ___Widowed

5. Social Security # _____

6. No. of dependents as determined by income tax exemptions: _____
(This information is necessary to arrange for stipends; no facilities are available in University housing for dependents.)

7. Present occupation: _____

8. Employer: _____ No. yrs. there _____

Address: _____ Supervisor _____

Give your job prior to present one: _____ No. yrs. there _____

9. Highest degree held: _____ School: _____

10. Presently attending college or university? ____Yes ____No If yes, name of school: _____

What degree are you working for? _____ Field of specialization _____

11. Have you had any formal training in statistics? _____Yes _____No. If yes,
Undergraduate _____ #semesters Graduate _____ #semesters

12. Have you had any formal training in research design or evaluation? ____Yes ____No
If yes, _____# Graduate Semesters

13. Have you had any actual experience conducting evaluations? ____Yes ____No

If yes, give title, date and location of most recent evaluation that you have been involved in:

_____
(Title of program) (Agency) (Date)

14. Have you had any actual experience developing educational programs? ____Yes ____No

If yes, give title, date and location of most recent educational development that you have been involved in:

_____
(Title of program) (Agency) (Date)

15. If no evaluation and/or development experience, what experience do you have in working in special education programs? List the two most recent projects that you have been involved in:

a. _____
(Title of program) (Agency) (Date)

b. _____
(Title of program) (Agency) (Date)

16. References: (Two persons professionally acquainted with you)

_____ _____
(Name) (Address)

_____ _____
(Name) (Address)

17. Write a brief statement (50 to 100 words) explaining why you wish to participate in this program. (If you need more space, please attach another sheet)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____ _____
(Today's date) Signature of applicant

Appendix 3

New York University

Institute of Afro-American Affairs

10 Washington Place, Room 500
New York, N.Y. 10003
Telephone: (212) 598-7095

June 20, 1972

Dear colleague:

I am pleased to inform you that you have been selected as a participant in The One Year Program to Train Educational Developers in Public School Systems sponsored by the Institute of Afro-American Affairs of New York University.

A list of specific instructions is enclosed which gives information about the various aspects of the program and the arrangements that will have to be made in connection with it.

I would like to take this opportunity to thank you for your interest in the program, and to extend my best wishes for a most beneficial and enjoyable experience.

Sincerely yours,

Roscoe C. Brown, Jr.

RCB:lb

New York University

Institute of Afro-American Affairs

10 Washington Place, Room 500
New York, N.Y. 10003
Telephone: (212) 598-7095

June 20, 1972

Dear colleague:

I regret to inform you that you have not been selected as a participant in The One Year Program to Train Educational Developers in Public School Systems sponsored by the Institute of Afro-American Affairs of New York University. Because of the limited number of positions available and the many applicants, competition for the positions was high and difficult choices had to be made. I would like to take this opportunity to thank you for your interest in the program, and to extend my best wishes for your future endeavors.

Sincerely,

Roscoe C. Brown, Jr.

RCB:lb

Appendix 4

DEVELOPERS' TRAINING PROGRAM

List of Participants

Name	District	Borough	Position
Mary Blassingame 1185 Anderson Ave. Bronx, N.Y. 10451	7	Bronx	Coordinator, Afro-American Culture & History Program
Evelyn Darer 736 Argyle Road Brooklyn, N.Y.	2	Manhattan	Assistant to Head Teacher
Rose D'Arrigo 95-22 Remington St. Jamaica, N.Y. 11435	28	Queens	Special Guidance Teacher: EEP
David Levy 395 Rutland Ave. Teaneck, N.J. 07666	7	Bronx	Executive Assistant to Community Superintendent
Ferdinand Mayernik 198 West Fulton Ave. Roosevelt, N.Y. 11575	16	Brooklyn	Urban Studies Teacher
Rose C. Jones 590 Flatbush Ave. Brooklyn, N.Y. 11225	NYC Central Bd. of Ed.	Brooklyn	Program Analyst Office of Career Education
Robert D. Pankey 350 Lenox Road Brooklyn, N.Y. 11226	16	Brooklyn	Dean of Discipline
Richard Pruitt 177-63 Ursina Road St. Albans, N.Y. 11434	28	Queens	Dean of Discipline
Tomasine Coombs Pruitt 117-63 Ursina Road St. Albans, N.Y. 11434	28	Queens	Ass't Principal

Name	District	Borough	Position
Angelo Sanchez 25 Pippen Place New City, N.Y. 10956	8	Bronx	Teacher (Industrial Arts)
Marilyn Shapiro 69 Van Boren Ave. Metuchen, N.J. 08844	24	Queens	Teacher of English as a Second Language
Vivian Sullivan 161 East 94 St. Brooklyn, N.Y. 11212	16	Brooklyn	Teacher (Health)
Mary J. Teshara 100-27 Benchley Pl. Bronx, N.Y. 10475	7	Bronx	Elementary Mathematics Coordinator
Norma E. Vargas 2707 Sedgwick Ave. New York, N.Y.	7	Bronx	Assistant Director Project Success
Hampton S. Williams 195 Willoughby Ave. Brooklyn, N.Y. 11205	16	Brooklyn	J.H.S. Principal

Appendix 5

Program Staff

Roscoe C. Brown, Jr.	- Director
LaMar P. Miller	- Associate Director
Carl Steinhoff	- Instructor
Janice Weinman	- Instructor
Carolyn Dorsey	- Instructional Assistant
Louise Baggot	- Project Assistant
Eloyse Defendini	- Secretary

Appendix 6

OUTLINE

Methods in Research and Evaluation of Education Programs

E10.2035 7/3 - 8/11/72, 9:30-12 and 1:30-4:00

Schedule	Topic
1st week	Morning/Afternoon
July 3	Registration, Orientation, Role of the Developer
4	Holiday
5	Identification of Educational Problems
6	Skills Needed in Solution of Educational Problems
7	Retrieval of Educational Information
2nd week	
July 10	Research Technique: Sampling and Research Design
11	Research Technique: Interviewing
12	Research Technique: Questionnaire Construction
13	Research Technique: Validity and Reliability
14	Research Technique: Analysis of Data: An Introduction
3rd week	
July 17	Test Development: An Introduction
18	Visit to Educational Testing Service, Princeton, New Jersey
19	Measurement and Evaluation in Practice
20	Modern Curriculum Development
21	Modern Curriculum Development

Schedule	Topic
4th week	Morning/Afternoon
July 24	Data Analysis: (Programmed Instruction) Introductory Statistics - Central Tendency and Variability
25	Data Analysis: (Programmed Instruction) Statistical Influence
26	Data Analysis: (Programmed Instruction) Correlation
27	Data Analysis: Use of Computers (NYU Computer Center)
28	Data Analysis: Use of Computers (NYU Computer Center)
5th week	
31	Use of Research, Retrieval and Analysis Skills in Educational Development
Aug. 1	Identification of Specific Problems By Each Group of Participants
2	Identification of Specific Problems By Each Group of Participants
3	Analysis of Steps to be Used By Each Group in Selecting Approaches for Development
6th week	
Aug. 7	Simulation: Sample Development Problem
8	Simulation: Sample Development Problem
9	Report and Proposal Writing
10	Report and Proposal Writing
11	Plans for Fall and Winter Term

Appendix 7

E20.2089
The Sociology of Complex Organizations
Fall, 1972 (T, 6:10-7:50)
Dr. Janice J. Weinman

General Information

1. Appointments: After class or at mutually convenient time

2. Phone: Office: 596-6020
Home: 724-6698

3. Course Requirements:

10 page paper
Final examination

4. Required Readings:
Recommended Texts: Etzionni, A. Modern Organizations. Prentice-Hall, 1964. Specified chapters.

Blau, P. and Scott, W.R., Formal Organizations. Chandler Publishing Co., 1962. Specified chapters.

Selected Articles: Specified under each topic.

Course Outline and Readings

Lesson 1: INTRODUCTION: Development of Organizations, Reason for Studying Organizations, Definitions

a. Etzionni, A. Modern Organizations, Chapter 1, pp. 1-4

b. Blau and Scott, Formal Organizations, Chapter 1, pp. 1-15

Lesson 2: The Function and Goals of Organizations

a. Etzionni, A. Modern Organizations, Chapter 2, pp. 5-19

b. Sills, D., "The Succession of Goals," in Etzionni, A., A Sociological Reader on Complex Organizations, Second Edition, Holt, Rinehart and Winston, 1969, pp. 175-187

Lesson 3: The Structure of Organizations: Formal and Informal Divisions

a. Blau and Scott, Formal Organizations, Chapter 4, pp. 87-100

Lesson 4: Organizational Theory

a. Etzionni, A. Modern Organizations, Chapters 3 & 4, pp. 20-49

Lesson 5: Control and Authority as Related to Organizational Structure, Functions and Goals

a. Etzionni, A. Modern Organizations, Chapters 6 & 7, pp. 58-74

b. Blau and Scott, Formal Organizations, Chapter 6, pp. 140-159

c. Merton, "Bureaucratic Structure and Personality," in Merton, Social Theory and Social Structure, pp. 195-206.

Lesson 6: Dilemnas of Organizations: Coordination and Communication, Authority vs. Peer Group Influence

a. Blau and Scott, Formal Organizations, Chapter 7, pp. 167-176, Chapter 9, pp. 242-250

b. Dalton, M., "Conflict Between Staff and Line Managerial Officers," in Etionni, A. A Sociological Reader on Complex Organizations, Second Edition, pp. 266-274

Lesson 7: Comparative Analysis of Schools, Hospitals, Business Corporations and Prisons: Similarities and Differences in Structure and Relationship to Client

a. Goffman, E., Asylums. Anchor, 1961, pp. 3-124

b. Dreeben, R., "The Contribution of Schooling to the Learning of Norms," in Harvard Educational Review, xeroxed article to be handed out

c. Callahan, R., Education and the Cult of Efficiency, University of Chicago Press, 1962, selected chapters

Lesson 8: The Board of Education as the Macroscopic Formal Organization: Leadership and Administration, Organizational Strain, Organizational Change

a. Blau and Scott, Formal Organizations, Chapter 9, pp. 250-253

b. Rogers, D. 110 Livingston Street, Vintage Book, 1969, Selected chapters

Lesson 9: The School as the Microscopic Formal Organization: Personality in Bureaucracy, Peer Group Pressure, Organizational Effectiveness and Morale

a. Blau and Scott, Formal Organizations, Chapter 4, pp. 100-115

b. Kreuter, M., "The Teacher in the Brown Paper Bag," xeroxed article to be handed out

Lesson 10: Influence of External Factors on Organizational Systems: Political Realities, Ad Hoc Pressure Groups, Parallel Governing Systems

a. Etzionni, A. Modern Organizations, Chapter 10, pp. 105-113

b. Xeroxed article on decentralization to be handed out

Appendix 8

NEW YORK UNIVERSITY
SCHOOL OF EDUCATION
Division of Educational Administration

E65.2305 Administrative Leadership in the Adoption of Innovation — Prof. Carl Steinhoff

Goals of the Course:

1. To examine theoretical bases for analyzing and understanding innovations;
2. To examine and assess recent innovations of consequence in education;
3. To delineate stages in the change process, to identify components critical to this process, and to define strategies for effecting changes in organizations;
4. To project areas in which further research on change is needed;
5. To explore implications which prospective changes in society may have for innovation in educational organizations.

Session	
1-3	Theories of Change
4-6	Leader Behavior
7-8	Human Growth and Development Laboratory
9-10	Individual Guidance of Projects (Roscoe Brown, Louise Baggett)
11	Organizational Climate and Organizational Health
12-13	Introduction to Simulation
14	Integrative Review
15	Final Exam

NEW YORK UNIVERSITY
SCHOOL OF EDUCATION
DIVISION OF ADMINISTRATION AND SUPERVISION

E65.2305 Administrative Leadership in the Adoption of Innovation

Carl R. Steinhoff, Associate Professor of Educational Administration

BIBLIOGRAPHY

Abbott, Max G., and Lowell, John T., Change Perspectives in Educational Administration, (Auburn: School of Education, Auburn University, 1965.)

Ardrey, Robert, The Territorial Imperative: A Personal Inquiry into the Animal Origins of Property and Nations, (New York: Atheneum, 1966.)

Argyris, Chris, Organization and Innovation, (Homewood, Illinois: Richard D. Irwin, Inc., 1965.)

_____, Integrating the Individual and the Organization, (New York: John Wiley and Sons, Inc., 1964.)

_____, Interpersonal Competence and Organizational Effectiveness, (Homewood, Illinois: Richard D. Irwin, Inc., 1962.)

Barnard, Chester, Functions of the Executive (Cambridge, Massachusetts: Harvard University Press, 1938.)

Bennis, Warren G., Benne, Kenneth D., and Chin, Richard, The Planning of Change, (New York: Holt, Rinehart and Winston, 1969.)

Bloom, Benjamin S., Stability and Change in Human Characteristics, (New York: John Wiley and Sons, Inc., 1964.)

Brickell, Henry M., Organizing New York State for Educational Change, (Albany: New York State Education Department, 1961.)

Carlson, Richard O., Adoption of Educational Innovation, (Eugene, Oregon: The Center for the Advanced Study of Educational Administration, University of Oregon, 1965.)

_____, and others, Change Processes in the Public Schools, (Eugene, Oregon: Center for the Advanced Study of Educational Administration, University of Oregon, 1965.)

Collins, Barry E., and Guetzhow, Harold, A Social Psychology of Group Processes for Decision-Making, (New York: John Wiley and Sons, Inc., 1964.)

Costello, Timothy and Zolkind, Sheldon S., Psychology in Administration: A Research Orientation. (New York: Prentice-Hall, Inc., 1963.)

Dubin, Robert and others, Leadership and Productivity, (San Francisco: Chandler, 1965.)

Eidell, Terry and Kitchel, Joanne M. (eds), Knowledge Production and Utilization in Educational Administration, (Columbus, Ohio: University Council for Educational Administration; Eugene, Oregon: Center for the Advanced Study of Educational Administration, 1968.)

Gordon, W. J. J., Synectics: The Development of Creative Capacity, (New York: Harper, 1961.)

Griffiths, Daniel E. (ed.), Behavioral Science and Educational Administration, Sixty-Third Yearbook of the National Society for the Study of Education, Part II, (Chicago: University of Chicago Press, 1964.)

Halpin, Andrew W., Theory and Research in Administration, (New York: MacMillan Co., 1964.)

_____, and Croft, Don B., The Organizational Climate of Schools, (Chicago: Midwest Administration Center, University of Chicago, 1963.)

James, H. Thomas, (et al.), The Schools and the Challenge of Innovation, (New York: McGraw-Hill, 1969.)

Katz, Daniel and Kahn, Robert L., The Social Psychology of Organizations, (New York: John Wiley and Sons, Inc., 1966.)

Lonsdale, Richard C., and Steinhoff, Carl R., (eds), The Administrative Analysis of Selected Educational Innovations. The Report of the First Inter-University Conference for School Administrators, July 29-31, 1963. (Syracuse: University Division of Summer Sessions, Syracuse University, 1964.)

Maslow, Abraham H., Toward a Psychology of Being, (Princeton, N.J.: D. Van Nostrand, 1962.)

Miles, Matthew B., Learning to Work in Groups, (New York: Teachers College Press, Columbia University, 1959.)

_____, Innovation in Education, (New York: Bureau of Publications, Teachers College, Columbia University, 1964.)

Miller, Richard I. (ed.), Perspectives on Educational Change, (New York: Appleton-Century-Crofts, 1967.)

Morphet, Edgar L., and Ryan, Charles O., (eds), Planning and Effecting Needed Changes in Education, (Publisher Press, 1967.)

Morris, Desmond, The Naked Ape: A Zoologists' Study of the Human Animal, (New York: McGraw-Hill Book Co., 1967.)

Rogers, Everett M., Diffusion of Innovations, (New York: Free Press of Glencoe, 1962.)

Sargent, James C., Organizational Climate of High Schools, (Danville, Illinois: Interstate Printers and Publishers, 1967.)

Schein, Edgar H., and Bennis, Warren G., Personal and Organizational Change Through Group Methods: The Laboratory Approach, (New York: John Wiley and Sons, Inc., 1965.)

Schutz, William C., FIRO: A Three Dimensional Theory of Interpersonal Behavior, (New York: Rinehart & Co., 1958.)

Sells, Saul B. (ed.), Stimulus Determinants of Behavior, (New York: The Ronald Press, 1963.)

Steiner, Gary A. (ed.), The Creative Organization, (Chicago: The University of Chicago Press, 1965.)

Steinhoff, Carl R., Organizational Climate in A Public School System, (USOE Cooperative Research Program OE-4-10-225, Syracuse University, 1965.)

Stern, George G., People in Context: The Measurement of Environmental Interaction in School and Society, (New York: John Wiley and Sons, Inc., 1970.

Watson, Goodwin (ed.), Concepts for Social Change, (Washington, D.C.: National Training Laboratories, NEA, Cooperative Project for Educational Development 1967.)

_____, Change in School Systems, (Washington, D.C.: National Training Laboratories, NEA, Cooperative Project for Educational Development, 1967.)

Appendix 9

HUMAN AWARENESS WORKSHOP I

Friday

Theme: Beginnings - consideration of the personal/social/physical environment; comparison to past similar experiences.

Theme: Functioning in an Unstructured Environment - moving from helplessness; stating expectations; and assuming responsibility for self and others.

Saturday

Theme: Effecting Organization - goal setting (individual and group); identifying hidden agendas; creative use of diverse elements; being a participant leader.

Theme: Integrating Myself into An Existing Organization - value patterns; dealing with evaluation; commitment to difficult situations.

Appendix 10

HUMAN AWARENESS WORKSHOP II

Friday

Theme: Relating to Authority - locating sources of power and powerlessness; hearing and being heard; finding my balance with "you."

Theme: Competing and Cooperating - trusting me, trusting you; the we/they split; healing splits; giving and getting.

Saturday

Theme: The Challenge of Change - locating resistance in myself and others; facing the unknown; volunteering; risks and rewards.

Theme: What I Had Hoped to Get From These Sessions That I Did Not Get

APPENDIX 11

INSTRUCTIONAL MATERIALS

FOR

"ONE YEAR PROGRAM TO TRAIN DEVELOPERS IN PUBLIC EDUCATION SYSTEMS"

List of Materials

1. The Role of the Educational Developer
2. Flow Chart for Developers
3. Differences Between the Educational Research and the Educational Evaluation Approach to Problem-Solving in Education
4. Guidelines for Planning Research
5. Search Procedure Form
6. Bibliographical Abstract
7. Retrieval of Information Module (developed by Far West Regional Lab.), used intact
8. Role and Function of ERIC Thesaurus in Education (ERIC, New York, New York), used intact
9. Research Interview Module (developed by Cornell University, Department of Education), used intact
10. Programmed Statistics Unit (developed by Dr. Neil Smith, Ph.D. Dissertation, New York University, School of Education, Copyright 1972), used intact
11. Portfolio of Simulations "New Technology in Organizational Development," (James Marshall, Publisher, 1972, Development Digest, Los Angeles, Calif.), used intact
12. Suggested Outline for Development Proposal

THE ROLE OF THE EDUCATIONAL DEVELOPER

What he (she) does:

Translates Research Findings into Usable Programs in Schools

By

Analyzing Educational Problems

↓

Developing Alternative Solutions

↓

Selecting and Implementing Programs to Solve Problems or Meet Needs

↓

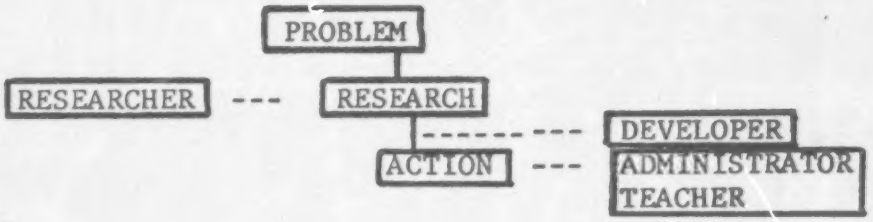
Evaluating Programs After They Have Been Implemented

In summary, he (she) is the middle person between Research and Action

What skills are necessary to be a developer:

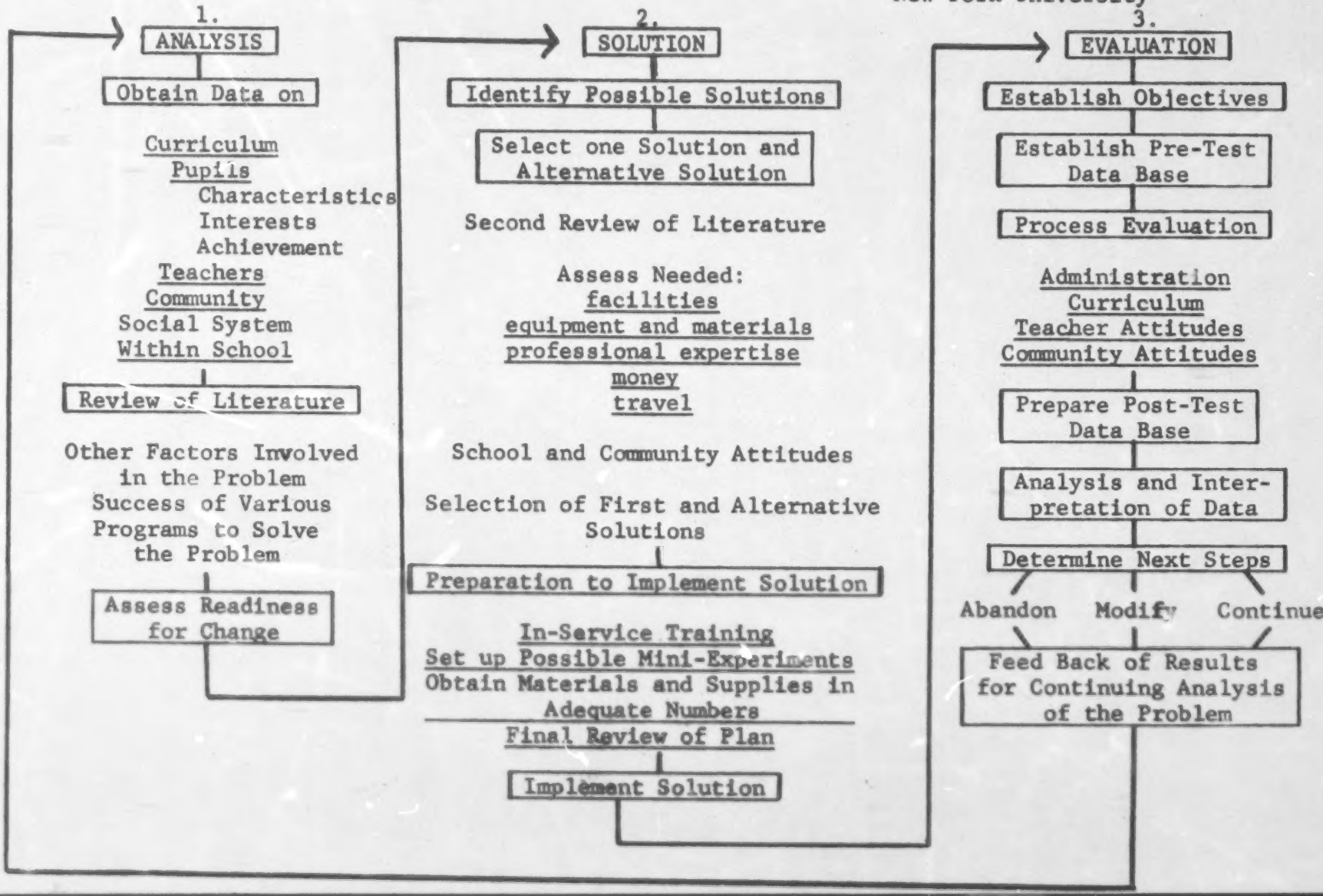
1. Knowledge of Research Techniques
2. Ability to Retrieve Information About Educational Problems
3. Ability to Negotiate and Communicate with Persons in Education, Government and the Community About Possible Approaches
4. Evaluation Skills Including Report Writing and Dissemination

Schematic Model:



FLOW CHART FOR DEVELOPERS
USE OF RESEARCH AND EVALUATION TO SOLVE EDUCATIONAL PROBLEMS

Prepared by
Roscoe C. Brown, Jr., Ph.D.
New York University



DIFFERENCES BETWEEN THE EDUCATIONAL RESEARCH AND THE EDUCATIONAL EVALUATION APPROACH TO PROBLEM-SOLVING IN EDUCATION

Area	Research	Evaluation
1. Training required	Extensive training in measurement, statistics, and research methods is needed.	Some training in statistics and research methods is needed. More training in educational measurement is needed than most teachers possess.
2. Goals	To obtain knowledge that will be generalizable to a broad population and to develop and test educational theories.	To obtain knowledge to determine the extent to which the objectives of a program (course) are met.
3. Locating the problem	Problems identified by a wide range of methods. Researcher must understand problem, but is usually not directly involved in it.	Problems identified in the school situation that are interfering with the efficiency of the instructional process.
4. Hypotheses	Highly specific hypotheses are developed that employ operational definitions and are testable.	A specific statement of the problem including objectives stated in behavioral terms usually serves as the research hypothesis

Area	Research	Evaluation
5. Review of the Literature	An extensive review of primary source material is necessary to give the researcher a thorough understanding of the current state of the knowledge in the research area. This enables him to build upon the knowledge accumulated by others.	A review of available secondary source material is necessary to give the evaluator a general understanding of the area to be evaluated. Exhaustive review of primary sources is usually not required.
6. Sampling	Researcher attempts to obtain a random or otherwise unbiased sample of the population being studied, but is usually not completely successful.	Pupils from the program being evaluated are randomly selected as subjects.
7. Experimental design	Design is carefully planned in detail prior to start of the study and adhered to as closely as possible. Major attention is given to maintaining comparable conditions and reducing error and bias. Control of extraneous variables is important.	Procedures are planned prior to the study in which the evaluation criteria are stated in clear, observable terms.

Area	Research	Evaluation
8. Measurement	An effort is made to obtain the most valid measures a vailable. A thorough evaluation of available measures and a trial of these measures (pilot study) usually precedes their use in the research.	Several measures for each criteria are selected or developed. A thorough evaluation of developed measures and a trial of these measures (tilot study) usually precedes their use in the evaluation.
9. Analysis of data	Complex analysis often called for. Inasmuch as generalizability of results is a goal, statistical significance is usually emphasized.	Appropriate statistical techniques for analysis are required although less complex analysis is usually sufficient.
10. Application of results	Results are generalizable, but many useful findings are not applied in educational practice.	Outcomes are used to make decisions whether to stop, continue, or modify the program being evaluated.

GUIDELINES FOR PLANNING RESEARCH

1.	Identification of the problem area or initiating idea -	What is the basic difficulty that has caught your interest or raised a question in your mind?
2.	Initial review of literature -	Need to become familiar with problem area.
3.	Definition of specific research problem -	What is it that you plan to investigate? Statement of specific problem.
4.	Questions to be answered -	When the research is finished, what are the questions to which reasonable answers can be expected?
5.	Estimation of success potential of study -	Make decision to; proceed without revision, modify and proceed, or abandon study.
6.	Rationale and theoretical base -	Second review of the literature to determine if study can be fitted into a conceptual framework that gives a structured point-of-view.
7.	Statement of the hypotheses -	Formal statement of the researcher's predictions. Be concrete and clear. Make sure that each hypothesis is stated in terms of <u>observable behavior</u>.
8.	Design -	Select the research approach, including the datagathering method and technique, and treatment variables to be manipulated.
9.	Selection and/or development of measurement instruments -	What instruments are needed to to meet the data need.
10.	Identification of population and sample. -	What are the population needs of the research. Who will your subjects; practical needs of the researcher and the realities of the research setting.

11. Assumptions - What assumptions have you made about the nature of the behavior you are investigating, the conditions under which the behavior occurs, your methods and measurements, or about the relationship of this study to other persons and situations?

12. Limitations - What are the limitations surrounding your study and within which conclusions must be confined? What limitations exist in your methods or approach; sampling restrictions, uncontrolled variables, faulty instrumentation, and other compromises to internal and external validity.

13. Delimitations - How have you arbitrarily narrowed the scope of the study?

Search Procedure Form

STEP ONE: DEFINE PROBLEM

STEP TWO: DERIVE GENERAL APPROACH

(CRITERIA)

SELECT RESOURCES

STEP THREE: DETERMINE SEARCH TERMS

Initial search terms: Added search terms:

Search Procedure Form (cont'd)

STEP FOUR: CONSULT RESOURCES

(SOME CRITERIA USED IN MAKING RELEVANT JUDGMENTS)

REFORMULATE PROBLEM (?)

STEP FIVE: LIST CITATIONS

Bibliographical Abstract

ERIC Code No._____

Author:_____
Title:_____
Source:

Pages:

Other:

Abstract:

Significance and Potential Use:

Evaluation:

RETRIEVAL OF INFORMATION

MODULE (DEVELOPED BY

FAR WEST REGIONAL LAB),

USED INTACT

ROLE AND FUNCTION OF

ERIC THESAURUS IN EDUCATION

(ERIC, NEW YORK, N.Y.),

USED INTACT

RESEARCH INTERVIEW MODULE

(DEVELOPED BY CORNELL UNIVERSITY,

DEPARTMENT OF EDUCATION)

USED INTACT

PROGRAMMED STATISTICS UNIT

(DEVELOPED BY DR. NEIL SMITH,

PH.D. DISSERTATION, N.Y.U., SCHOOL OF EDUCATION,

COPYRIGHT 1972), USED INTACT

Instructional Supplement - 10

PORTFOLIO OF SIMULATIONS "NEW TECHNOLOGY IN ORGANIZATIONAL DEVELOPMENT" (JAMES MARSHALL, PUBLISHER, 1972, DEVELOPMENT DIGEST, LOS ANGELES, CALIF.), USED INTACT

Suggested Outline for Development Proposal

Descriptive Title

Introduction
- Background of Problem
- Reason for selecting this area for development

Purpose
- Problem and Sub-problem

Review of Literature
- Brief review of related writings and projects

Procedure
- What is to be done - behavioral objectives
- Who is to be involved - which pupils, teachers, administrators, community workers, etc.
- Where will it be done - places, locations
- When will it be done - dates
- How will it be done - specifics for each step

Use headings like:
- Objectives
- Participants
- Sites
- Time Schedule
- Development and Implementation of the Program

Evaluation
- Performance criteria
- Sample
- Instruments
- Procedure in collecting data
- Methods and techniques of analyzing data
- Formative and summative evaluation

Bibliography
- Major references

Appendices
- Including sample instruments

Qualifications of Project Director

Education
Experience
Publications
Special skills and qualifications,
including previous projects

RATING SCALE FOR EVALUATION OF FINAL REPORTS

Name COMPONENTS	10 - 9	8 - 7	6 - 5 CRITERIA	4 - 3	2 - 1	SCORE
QUALITY OF WRITING	Clear, concise, professional.	Mostly clear, style somewhat awkward, some personalization.	Some tangents, journalistic, personal.	Rambling, repetitious, personal.	Vague, improper grammar.	
PRESENTATION OF IDEAS	Well organized progression.	Fair overall organization. Links not always clear.	Well conceived ideas. No organization.	Incomplete thoughts supported by emotional appeals	Incoherent, emotional.	
THEORETICAL FRAMEWORK	Logical substantiation. Extensive use of literature.	Structure somewhat weak, adequate coverage of literature.	No apparent structure, adequate coverage of literature.	No apparent structure, sketchy coverage of literature.	No structure, insufficient coverage of literature.	
CONSTRUCTION OF DESIGN	Cohesive plan, clearly defined objectives & procedures.	Total plan not clearly indicated, most objectives not defined.	Total plan not clearly indicated, some objectives not defined.	No overall plan, some objectives not defined.	No overall plan, objectives not defined.	
IMPLEMENTATION PROCEDURES	Practical, realistic, directed toward attainment of objectives.	Practical, realistic, some objectives not covered.	Some impractical steps, some objectives not covered.	Some impractical steps not related to objectives.	Impractical, unrelated to stated objectives.	
EVALUATION, DATA COLLECTION PROCEDURES & ANALYSIS	Descriptive measures directed toward objectives, appropriate analysis.	Descriptive measures directed toward objectives, inadequate analysis.	Some personal subjective opinion, some objectives n not measured.	Some personal subjective opinion not related to objectives, some objectives not measured.	Subjective, personal opinions not related to objectives.	

GRADE FOR REPORT_____ GRADE FOR COURSE_____ TOTAL SCORE

APPENDIX 13

Sample Project Report

THE 3 M PROJECT
MOTIVATING MATHEMATICS MECHANICALLY

June 1, 1973

ONE YEAR PROGRAM TO TRAIN DEVELOPERS
IN PUBLIC EDUCATION SYSTEMS
Dr. R. C. Brown, Jr., Director

Submitted by:
Mary J. Teshara

CONTENTS

I INTRODUCTION

Background
Project Statement
Review of Literature

II PROJECT DESCRIPTION

Personnel
Pupils
Materials and Resources
Step by step Procedures

III RESULTS AND EVALUATION

What Actually Happened

IV RECOMMENDATIONS

V BIBLIOGRAPHY

INTRODUCTION

BACKGROUND

District Seven, the school district with which this project concerns itself, is at the southern tip of the Bronx. It is an area populated almost 100% by Black and Puerto Rican families. And, since all of its schools have been designated, "Title I schools," the school population can be said to be disadvantaged. There are, of course, exceptions as in the case of every generalization.

Millions of dollars of Title I money has been spent in District Seven, much of it on reading programs. Even so, it is a place where both teachers and supervisors shrink and cringe cravenly when the Times prints its yearly "expose" of ever-dropping reading scores, although, for the most part, they have tried desperately to unlock the magic door to reading for their pupils.

The cold fact is that most of our pupils are not working up to their potential, no matter what the subject area. As with reading, much research has been done to try to pinpoint those factors which constitute roadblocks to the learning of mathematical concepts, their retention and application to other problems. Mathematics educators are constantly seeking to unearth some specific implications for teachers who are faced with pupils who do not learn with traditional teaching techniques.

And, as with reading, much less publicized but just as relentless, with the spring comes the standardized mathematics

achievement tests. They show that as the pupils proceed upwards through the grades, their scores pursue a downward path. The chart pictured below shows the school-wide scores for the 8th grade pupils of the district in 1971 and 1972. Since the tests were given in April, grade level would be 8.7 (for the seventh month of the eighth grade.) Intermediate School 139, the school in which this project will be set up, consistently scores more than 1½ years below grade level and 1972's pupils scored 2 months lower than 1971's.

METROPOLITAN ACHIEVEMENT TESTS 8TH YEAR ARITHMETIC

SCHOOL	COMPUTATION		CONCEPTS		PROBLEM-SOL.		TOTAL	
	71	72	71	72	71	72	71	72
IS139X	7.0	6.6	6.3	6.8	6.1	5.8	6.3	6.1
JH149X	6.6	7.8	5.8	7.1	6.4	7.1	6.2	7.3
IS155X	7.4	7.1	6.9	6.5	6.8	6.2	7.0	6.5
IS162X	6.9	6.5	5.7	5.6	6.3	5.7	6.3	5.8
Dis.-wide	7.0	7.0	6.3	6.4	6.4	6.2	6.5	6.5
City-wide	7.8		7.3		7.7		7.6	

There are many hidden factors not revealed by the above Metropolitan Achievement Scores such as excessive review of test-like items for several weeks before the test and the many pupils who are not tested at all.

But all pupils, the bright, the plodders and the reluctant learners, need to have an insight into the structure of the number system in order to become efficient human beings. So, we must continue to explore ways of motivating the slow learner

and enriching the mathematical experiences of the more able pupil. Research has not as yet discovered a definitive course of action that will insure understanding, but, they have pinpointed some reasons for failure and highlighted some components of effective programs. Ronald S. Horowitz stated in his article, Teaching Mathematics to Students with Learning Disabilities:

> If a student has intellectual potential, his failure to acquire basic mathematical skills is often due to a lack of readiness, ineffectual teaching, or a combination of both. The teacher misinterprets rote memorization to mean that a child understands the lesson, and subsequent materials proves too difficult because the foundation is weak. A cycle of failure becomes a psychological block for all mathematics. Manipulations have often been introduced prematurely. Many students have progressed from $3 \times 5 = 15$ through $3a \cdot 5ab$ without understanding the concepts involved. The result of putting a cart of drill and memorization before the horse of understanding is that many students tune out of mathematics.

Another plea for teaching children to understand instead of rote memorization is found in John Holt's words in his book, How Children Fail:

> We must not fool ourselves, as for years I fooled myself into thinking that guiding children to answer by carefully chosen leading questions in any respect is different from just telling them to answer in the first place. Children who have been led up to answers by teacher's questions are later helpless unless they can remember the questions or ask themselves similar questions, and this is exactly what they can't do. The only answer that really sticks in a child's mind is the answer that he asked or might ask himself.

Ruth Irene Hoffman writing in The Bulletin of The National Association of Secondary-School Principals, expresses non-performance in mathematics as follows:

> Fear of mathematics and a distaste for any computation or for the kind of analytical thinking that typifies mathematics--these qualities characterize the slow learner in mathematics. This fear and distaste are born most frequently of some early fuzzy understanding or lack of understanding and are nurtured in succeeding years by the frustration of attempting to build new understandings on a nonexistent foundation.

The project, Motivating Mathematics Mechanically, will address itself to, and hopefully, ameliorate some of the problems described above.

PROJECT STATEMENT

To apply a directed, scientific approach to the teaching of mathematics to selected 7th grade pupils attending Intermediate School 139X in District Seven, Bronx, in conjunction with, and as a supplement to the regular didactic approach, for the purpose of building a deeper understanding of the subject matter, therefore, improved performance.

To provide stimulus through the use of various types of calculators (electric, electronic, and manual) with their own built-in reward systems , to capture their students attention for the more basic lessons. To make the pupils aware of the many ways that mathematics is being applied in their own environment through the use of films, filmstrips and examination of business and professional documents. The project will also use games, projects, and constructions to demonstrate to pupils that mathematics is essential to anything they might want to do.

REVIEW OF THE LITERATURE

Over the past decade, the availability of federal funds for experimental educational projects has been responsible for the creation of many innovative programs. They have focused on all types of pupils; above average in ability, average and below average, to try to determine learning styles. By far, the greatest attention has been directed toward pupils with learning difficulties. The literature has variously referred to them as slow learners, reluctant learners, the unmotivated, low achievers, culturally, economically, environmentally and socially deprived, disadvantaged, etc., and these terms will be used interchangeably throughout the program.

In response to an awakened populace, researchers and program developers have sought to diagnose the learning problems of these low-achievers and develop prescriptive programs.

A review of some of these project-oriented mathematics programs has pointed to one conclusion--almost all students, but especially slow learners achieve better in activity-oriented mathematics programs, programs in which the pupil becomes physically involved in his own learning.

These activities must be so contrived as to facilitate learning a hierarchy of needed concepts which emphasize real world applications. They become an integral part of a mathematics program in which pupils manipulate actual models or representations of mathematical principles, and where the pupils make use of flow-charts, calculators and other materials.

In short, pupils learn best by doing.

William Fitzgerald, used the following paragraph from Teaching Mathematics (fifth edition) to describe the merits of an action mathematics program:

> ... students will develop new concepts and understandings particularly well through experimental activities dealing with concrete situations such as measuring and drawing, counting, weighing, averaging and estimating: taking readings from instruments, recording, comparing, analyzing, classifying, seeking patterns, and checking data: and that interest will be stimulated and understanding will be clarified through obtaining original data or impressions from concrete physical situations and working with such data. Most work of this nature will involve the use of various kinds of physical equipment and will entail such activities as those listed here ... Most students find this work highly interesting and it is doubtlessly true that through it, they can develop many mathematical concepts and insights with an interest and clarity often not obtained through a strictly intellectual approach. It is also likely that these concepts and principles become more enduring and more functional and meaningful when they are seen in relation to actual application.

In A Preliminary Evaluation Report on a project in the Los Angeles City Schools (LAMMP), C. Wayne Gordon found that after one year in the program, the experimental group were better able to deal with formal reasoning, had developed the ability to generate abstract rules or principles that explained observed events, and had a better grasp of measurements and other concepts than did the control group.

In his summation, he made a strong case for open lines of communication between project leaders and project teachers and a closer connection between the evaluation and the process

of developing the instructional program.

Joseph P. Cech found no significant difference in his research on the effect of the use of desk calculators, on attitude and achievement with low-achieving 9th grade students in Park Ridge, Illinois. However in my opinion, seven weeks is much too short a period for low achievers to manifest an appreciable difference and his research suffers from the paucity of time alloted to the study.

On the other hand, Jon L. Higgins claims to have had positive results in attitude changes towards mathematics from a "mathematics-through-science laboratory" approach in a five week study made with twenty-nine 8th grade classes.

Although no formal measuring devices were used to assess the relative success of the research study, Project SOSO (Save Our Slow Ones), Prof. Daisy Howell of Delta State College, in Cleveland, Mississippi, reports satisfactory results. The project was used with 6th grade pupils, but her methods could just as easily be used with 7th and 8th graders. Project SOSO was spread over two summer workshops where teachers were trained to make and use manipulative materials to help them in the implementation of the curriculum. She summarized as follows:

> Project SOSO was not expected to work miracles. The greatest rewards came in watching the enthusiastic response--of the teachers and the students as they worked with the materials and multi-sensory aids. When students understand some things better, they lose some of their fear of mathematics, and say, 'Its been fun and we've learned a lot,' then all the work that went into Project SOSO has been worthwhile.

Because the pupil population in SOSO parallel those in our proposed project so closely, and because many of our procedures will be the same as theirs, the following observations made by their research team will be of interest:

1. At first, the students were ackward in manipulating the multisensory aids. Very often the multisensory aid landed on the floor during the student's first attempt to use it. Gradually the students became more comfortable with these aids and expected some multisensory aid when a new concept was introduced. 'Are we going to get something new to work with today?' became a regular question to the research team.

2. The students were always highly enthusiatic about their work. They were never shy with the research team and constantly wanted to show how well they could perform. (This was unexpected--the research team had anticipated a very low motivational level). Confidence, pride, and a feeling of real success were evident the day two of the students, Lisa and Ellen, taught the principal how to use the fraction bars to find the sum of 2/3 and 4/5.

3. The overhead projector fascinated the students. Even completing a simple addition table became an exciting procedure when the student demonstrated their ability to perform simple sums by using the overhead projector. It was a special thrill for each student to use the overhead projector and the teacher's model of the spike abacus, the fraction bars, or the tiles to illustrate his understanding of a mathematical concept to his peers.

4. Frequent changes in activities were necessary to keep the students interested. When students worked for more than three consecutive periods on one topic, the research team noticed some restlessness and boredom. Probability was the one topic that never seemed to bore them. Spinners, checkers, dice, coins, spoons and racetracks always appealed to the students.

5. Visual aids helped in developing understanding of certain concepts, particularly with operations with fractional numbers. During the evaluation period, the children were asked what had been the most enjoyable topic. Without exception they answered, 'Fractions!' The research

team was surprised but attributed the success of this topic to two things: (1) the students had thoroughly enjoyed using the fraction bars as well as the fractional parts to discuss equivalent fractions and operations with fractional numbers; and (2) at this point the

Pupils and researchers in Project SOSO at left and bottom right.

regular classwork correlated with the activities in Project SOSO. Students derived great pleasure from showing their classmates in the regular classroom a 'new way' to add fractional numbers. The understanding of concepts was more clearly observed when the work in Project SOSO correlated with regular classroom work.

Broussard, Fields and Reusswig made a study of the use of activity mathematics programs in grades 7-12. They summarized their findings in the publication, A V Instruction, as follows:

> A program for low-achievers from disadvantaged areas which emphasized real-world applications, flowcharting, calculators and other materials resulted in significant achievement gain. Sixty percent of the students who had participated in the program, continued to take mathematics courses compared with forty percent in a control group.

Kenneth Travers, John LeDuc and Garth Runion did a research study for ERIC in which they reviewed the literature and summarized research projects in mathematics

for low-achieving students. The consensus of the findings was that a mathematics program in which pupils could become physically involved, has proven to be the most successful.

Although most mathematics action programs make use of various kinds of calculators, very little research seems to have been done on their effectiveness in raising achievement scores. Perhaps the part played by the machines themselves would be too difficult a variable to isolate and measure. However, all will admit to their value as motivational and interest-evoking devices. As such, they're worth their cost and are a definite MUST for a "hands-on" program.

Again and again throughout the literature, mathematics program planners have asked themselves and research, "What instructional strategies can and should be employed in order to predict with confidence that pupils will develop the abilities to think independently, to make choices, to plan, and to evaluate?"

In most of the literature reviewed or cases studied, the programs were of short duration, much too short for any appreciable difference to have taken place in pupils' scores. So, many of the conclusions are idiosyncratic. With others, there were too many intervening variables to get a valid result. However, where so many persons with such varied backgrounds, have come to the same conclusion--students learn more when they are actively involved in their own learning, such a program must have many worthwhile aspects.

II - PROJECT DESCRIPTION

Personnel

Only one person in the school will be involved with this project. She is a regularly-appointed, experienced mathematics teacher who has been in the school about 12 years. She has an excellent working relationship with her pupils and is usually more successful than other teachers in her school in getting pupils to strive towards reaching their potentials. This teacher has taken courses in the new approach to mathematics and she believes in the ideas and teaching techniques set forth in this proposal and will do her utmost to make its implementation a success.

Pupils

The pupils of the program will be four 7th grade classes programmed to this teacher. Because of difficulties inherent in a tight programming and scheduling situation, and since the program must be implemented without extra expenditures, there can be no special selection of pupils. (The class designations and pupil's name will be entered later).

Materials and Resources

The calculators and many of the other materials mentioned below were obtained by the writer of this proposal from a mini-grant. It was a one-time offer for materials only.

Criteria for the selection of a particular material was based on a scale similar to the one on the next page by Norbert H. Leeseberg.

Evaluation Scale for a Teaching Aid in Modern Mathematics

Norbert H. Leeseberg

_____ Name of Teaching Aid Being Considered

_____ Name of Manufacturer

_____ Address of Manufacturer

INSTRUCTIONS: List the rating you wish to make for each criterion: 3–Excellent, 2–Good, 1–Fair, 0–Not Useful. Add all the ratings and determine the overall rating by using the following scale:

36–45 Excellent: Highly recommended for purchase and use
26–35 Good: Recommended for purchase and use with some reservations (see comments)
16–25 Fair: Not recommended for purchase and use by evaluator
0–15 Not Useful: Not considered useful by evaluator

CRITERIA	COMMENTS
___ 1. Approach suggested for use of the aid	
___ 2. Application of principles	
___ 3. Provisions for individual differences	
___ 4. Usability by children individually or in small groups	
___ 5. Time use during the year	
___ 6. Multigrade-level use	
___ 7. Cost	
___ 8. Durability	
___ 9. Relationship to text in use	
___10. Expectations of teacher for demonstration	
___11. Commercial product vs. teacher-made product	
___12. Practicability	
___13. Storage potential	
___14. Attractiveness of product	
___15. Learning device vs. busywork	

___ TOTAL _____ RATING

RECOMMENDATION

_____
Signature of Evaluator

_____ _____
Grade Date

Equipment	Use
Calculators Electronic (Sharp & Olivetti) Electric (Victor) Manual (Olivetti & Busicom)	For checking all kinds of calculations. For help in complex computation. To study their use in business and professions.
Overhead Projector	For demonstrations by teacher or students.
Film strip projector	
Mathematics typewriter	
Manipulatives	
Measurement Kit Mechanics Kit	To develop skill in following directions and problem-solving.
Arithmablock Fraction Kits	Operations with fractions.
Tangrams) Geo-boards)	Area and perimeter relationships.
Slide Rules	
Polyhedron construction Kits	
Calipers	Measurement
Dienes Multibase Arithmetic Blocks	Bases
Attribute Games	Sets and Logic
Games	
3-dimensional Tic Tac Toe	Skill building & analytical thinking
Probability & Statistics Kit	
Tuf-equations game Stocks and Bonds	
Prime Drag Bali-Buttons	
Tower Puzzle	
Also	
Remedial Mathematics skill building kits	

Step by Step Procedures

Pupils will be pretested on the Intermediate Level of the Metropolitan Achievement Test at the beginning of the program. This procedure is simply to establish a starting point and serve as a basis for planning. There will be no control groups. This aspect is seen as too difficult to manage while carrying on a full time job.

In the program, pupils will continue to have five 45-minute periods of mathematics a week, three or four of which will continue to be taught in the usual manner. At least one period a week will be set aside for an ACTION math period. This will be the mathematics applications period in which pupils will use materials or devices to introduce or reinforce some specific or concept.

Examples

Concept - Renaming common fractions as decimal fractions or percents. Concept with reinforcing problems introduced during regular class period. In the applications period, pupils may choose to use the calculators, grids with moveable blocks or pins, film strips on the subject or some of the other materials that will have been supplied. But, everyone will be working on the same general topic either individually or in groups. Job cards for the particular concept will be supplied with each set of materials or equipment with which that concept can be reinforced.

Concept - Scientific notation and numeration systems.

Materials--Dienes multibase blocks and/or blocks and cubes from Cuisenaire.

Concept - Significant digits. Reinforcing agent - calculators.

Concept - Perimeter-area relationships. Pupils will work in groups of tangrams and geo-boards.

III. RESULTS AND EVALUATION (What Actually Happened)

The Room

A large room with tables was set aside for the Mathematics Applications program. A metal door with a special lock was added. The teacher was able to get the woodworking shop to build carrels around the walls of the room. It was here that the listening stations were set up. They also house some of the calculators.

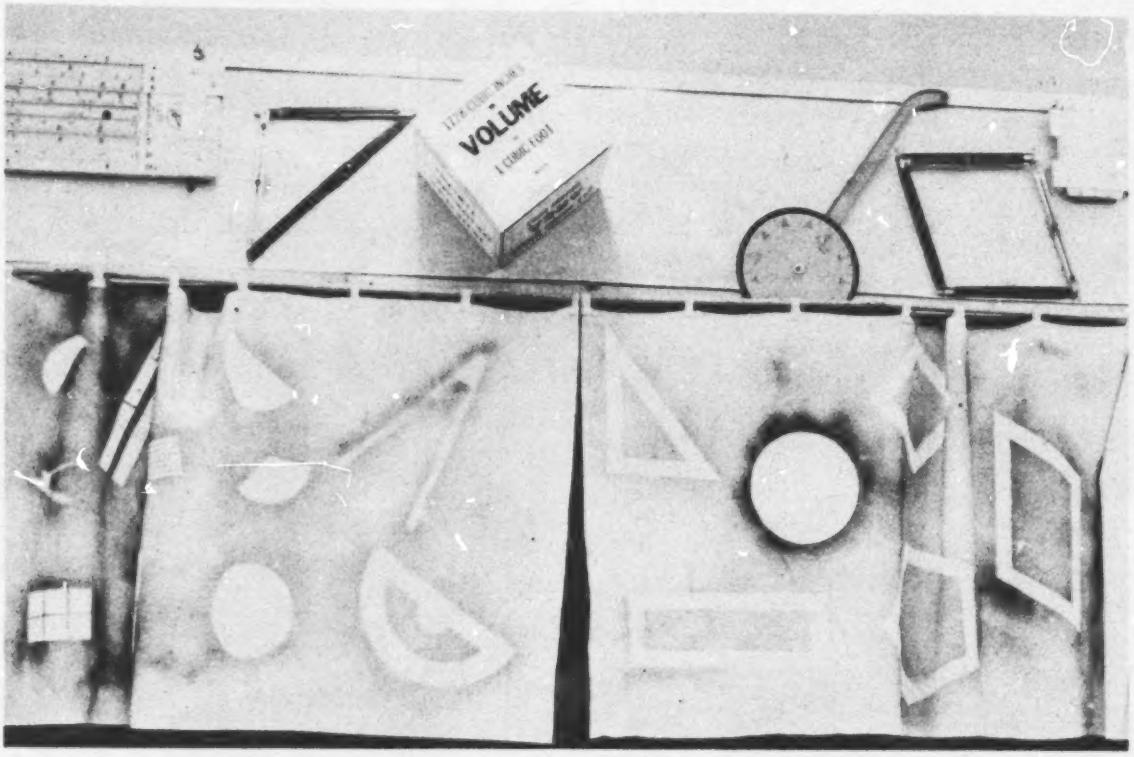
The carrels can be seen in the background. (Student passing out folders.)

Note storage areas in the background.

There was also provisions for ample storage shelves around the room for the math manipulatives and activity sheets.

The pupils assisted in the decoration of the walls, the bulletin boards, and window shades. Mathematical symbols and designs were put on with spray paint. Math posters and puzzles were hung on any remaining wall space. (See picture at top of page 107).

A library of mathematics books (on the pupils' reading and interest level.) (See picture at bottom of page 107).



Another view of the math Applications Room

The Pupils

Four seventh grade classes were involved. The teacher described them as being about the middle of the grade in ability and achievement. They were tested in October, 72 on the Mathematics Metropolitan Achievement Test, Intermediate level. (Test not usually administered to 7th graders.) Their pretest and Posttest scores are on pages 109 and 110. The range in the four classes was from 2.6 to 6.6 at pretest time, i.e., from 6 months to 4 years below grade level.

The room was not ready and the materials were not completely gathered and sorted until mid-November, so that program got off the ground about that time.

Class: 7-211

Pretest and Posttest Scores (pretest October, 72--Posttest May, 73)
Metropolitan Achievement Test - Intermediate level--Form H MATHEMATICS

Names		Prestest Oct., 72				Posttest May,73			
		Comp.	Conc.	Prob.	Tot.	Comp.	Conc.	Prb.	Tot.
Bordinado,	Milton	3.8	3.0	2.8	3.2	4.5	3.0	2.9	3.4
Colon,	Jose	6.2	6.0	5.8	6.0	7.0	6.0	5.6	6.2
Cruz,	Damon	5.0	5.0	4.6	4.8	4.8	5.4	5.0	5.1
Newbold,	Wilfred	5.2	4.9	5.0	5.0	4.2	5.1	4.6	4.6
Polanco,	Luis	3.0	3.1	2.7	2.9	5.6	4.9	5.0	5.1
Rosado,	Edgar	2.5	3.1	2.6	2.7	3.6	3.6	3.0	3.4
Tyrone,	Spain	2.6	3.8	3.1	3.1	5.2	6.0	4.8	5.3
Townsend,	Christopher	2.8	3.4	3.0	3.0	6.0	4.5	5.0	5.1
Valentine,	Kelvin	2.8	3.4	3.0	3.0	6.5	5.8	6.2	6.1
Adorno,	Abraham	2.8	2.8	2.7	2.7	4.4	3.8	3.8	4.0
Broady,	Jacqueline	2.6	3.8	3.1	3.1	6.0	4.5	5.2	5.2
Carter,	Sabrina	2.3	3.4	2.6	2.7	5.0	5.1	5.0	5.0
Clemente,	Doris	2.8	3.8	3.2	3.2	3.5	4.0	4.5	4.0
Gomez,	Helia	2.3	3.1	2.4	2.6	5.0	4.1	4.6	4.5
Harris,	Linda	2.5	2.8	2.5	2.6	5.6	4.5	4.0	4.7
Hernandez,	Gloria	2.5	3.8	3.0	3.1	4.2	4.1	4.1	4.1
Jones,	Tonya	2.8	4.1	3.3	3.4	3.5	4.0	3.0	3.5
Lagner,	Amanda	3.2	3.1	3.1	3.1	4.0	3.5	3.1	3.5
Perlote,	Janice	3.2	2.8	3.0	3.0	3.3	3.2	3.0	3.1
Quintero,	Iris	5.5	6.0	5.2	5.5	5.5	5.1	5.4	5.3
Rayodale,	Denise	5.3	5.3	5.3	5.3	4.8	5.0	5.1	5.1
Roman,	Maritza	5.6	5.7	5.6	5.6	5.2	4.9	5.0	5.0
Rosado,	Blanca	4.2	5.7	4.9	4.9	5.4	5.5	5.5	5.4
Singleton,	Cordelia	5.0	6.1	5.5	5.5	5.8	5.0	6.0	5.6
Acevedo,	Maria	2.8	3.8	3.2	3.2	4.4	3.6	3.1	3.7
Class: 7-316									
Cruz,	Madeline	3.8	4.3	3.9	4.0	3.9	4.5	4.1	4.1
Garcia,	Leticia	5.4	7.3	6.4	6.3	5.6	6.3	6.7	6.2
Luronzo,	Bienes	4.8	7.3	6.0	6.0	4.9	7.4	6.5	6.2
Santiago,	Rosa	5.0	6.2	6.0	5.7	6.5	6.3	6.4	6.4
Velcheo,	Velma	5.6	6.9	6.2	6.2	5.9	7.3	6.4	6.5
Young,	Elfreda	4.4	4.3	4.3	4.3	5.6	4.3	4.9	4.9
Allen,	George	3.8	4.5	4.2	4.1	4.4	4.4	4.4	4.4
Amaro,	Angel	2.5	2.3	2.8	2.5	3.4	4.0	3.6	3.6
Bell,	Jose	4.2	6.0	5.0	5.1	5.6	6.1	4.9	5.5
Escobar,	Jose	4.1	4.1	4.5	4.2	4.9	3.8	4.5	4.4
Espola,	Noel	3.0	4.3	3.5	3.6	3.0	4.0	4.1	3.7
Love,	Carlos	4.8	4.8	4.6	4.7	4.9	4.6	4.8	4.7
McCoy,	Albert	3.3	4.5	3.8	3.8	3.8	4.8	4.3	4.3
Ramos,	Sam	3.2	3.6	3.3	3.3	3.9	4.1	3.6	3.8
Rodriguez,	Alfred	4.4	3.8	4.2	4.1	3.9	3.9	4.0	3.9
Suris,	Ricado	4.0	3.0	3.6	3.5	4.9	3.0	3.7	3.8

Metropolitan Achievement Test - Intermediate Level - Form H MATHEMATICS
Pretest and Posttest Scores

NAMES		Pretest Oct., 72				Posttest May, 73			
		Comp.	Cpts.	Prob.	Tot.	Comp.	Cpts.	Prob.	Tot.
Class 7-320									
Alejondra,	Edwin	4.2	4.1	4.2	4.1	4.7	3.9	3.8	4.1
Bermudez,	Jose	3.2	2.4	2.7	2.7	3.7	3.2	3.0	3.3
Berrios,	William	2.3	3.6	2.7	2.8	3.7	3.8	3.7	3.7
Camandro,	Ismail	3.9	2.3	3.2	3.1	3.2	3.6	3.3	3.3
Chadwick,	Darryl	3.5	4.5	3.9	3.9	3.9	4.0	3.8	3.9
Elores,	Enrique	4.2	4.5	4.4	4.3	4.9	4.5	4.1	4.5
Rivera,	Deddro	2.8	2.8	2.7	2.7	3.0	2.8	2.6	2.8
Rodriguez,	Eddie	4.1	4.8	4.4	4.4	4.0	4.5	4.6	4.3
Ronbert,	Benjamin	4.1	3.8	3.9	3.9	3.7	4.0	4.1	3.9
Ayala,	Miriam	7.0	6.2	6.1	6.4	7.4	6.0	6.5	6.6
Brown,	Cassandra	7.6	5.2	6.2	6.3	8.0	5.5	6.2	6.5
Cruz,	Madeline	3.7	4.2	3.8	3.9	5.4	4.8	4.2	4.8
Dunbar,	Bernice	4.0	4.5	4.1	4.2	4.8	4.9	4.0	4.5
Garcia,	Leticia	5.3	7.2	6.0	6.1	6.5	7.0	6.2	6.5
Perez,	Magdalena	4.9	7.4	6.2	6.1	5.8	6.9	6.3	6.3
Rondon,	Madeline	5.0	7.1	6.0	6.0	5.5	7.0	6.4	6.3
Rondon,	Maritza	4.0	4.6	4.3	4.3	4.0	4.4	4.0	4.1
Santiago,	Rosa	5.7	7.0	7.2	6.6	6.0	7.1	7.2	6.7
Sotomayer,	Elizabeth	4.2	4.1	4.1	4.1	6.0	5.3	5.2	5.5
Class 7-328									
Carrero,	Benjamin	5.6	4.3	4.9	4.9	6.8	5.0	5.1	5.6
DeJesus,	Wilfredo	5.6	4.8	4.9	5.1	6.2	4.9	5.0	5.3
DeVere	Charles	4.1	4.5	4.3	4.3	6.0	4.5	4.4	4.9
Gonzalez,	Raymond	6.0	6.7	6.4	6.3	7.2	6.9	6.2	6.7
Martinez,	Jose	3.9	4.5	4.9	4.4	5.2	4.6	4.9	4.9
Melendez,	Jose	5.2	4.8	4.9	4.9	6.0	4.8	4.6	5.1
Ramsey,	Mark	3.2	4.3	3.6	3.7	5.4	4.9	4.3	4.8
Rentas,	Pedro	3.7	4.5	4.1	4.1	6.0	4.8	4.5	5.2
Rivera,	Elvin	3.1	3.0	3.2	3.1	4.2	3.5	3.3	3.6
Rodriguez,	Juan	3.8	4.4	4.0	4.1	4.2	4.5	4.0	4.2
Valencia,	Ricado	2.8	2.1	2.2	2.3	3.9	3.0	2.6	3.1
Vargas,	Danny	4.7	5.3	4.9	4.9	6.7	5.4	5.0	5.7
Garcia,	Ricki	4.2	5.9	4.6	4.9	6.5	6.0	4.6	5.7
Almodovar,	Migdalia	3.3	2.4	2.8	2.8	5.0	2.8	3.1	3.6
Baez,	Nancy	3.8	4.4	4.1	4.1	4.2	4.4	4.2	4.2
Gomez,	Zoraida	5.3	2.8	3.3	3.8	6.0	4.0	3.5	4.5
Marable,	Vanessa	5.6	5.5	5.0	5.3	6.8	6.0	5.0	5.9
Marvez,	Ivette	5.0	6.5	5.7	5.7	5.5	6.6	5.5	5.8
Rivera,	Lisandra	4.7	4.9	4.8	4.8	6.1	5.2	5.0	5.4
Rivera,	Luz	3.5	3.6	3.5	3.5	4.2	4.0	3.4	3.8
Rodriguez,	Janet	4.8	5.5	5.0	5.1	5.4	5.8	5.2	5.4
Rodriguez,	Maria	4.4	5.3	4.8	4.8	4.9	5.5	5.2	5.2
Rodriguez,	Tavia	4.2	4.3	4.3	4.2	6.4	5.0	5.5	5.6

For the first 2½ months of the school year, the periods that were to become the Applications periods were used as two extra mathematics periods per week for the pupils involved. The Applications teacher did very much the same things that their regular mathematics teacher did.

But as the room neared completion, she started off the program by the undirected use of skill games. This was a mistake. By the time the room was completely set up for the program, the pupils had become accustomed to "playing" with the games and it took a great deal of patient urging to set up work routines. The pictures that follow tell better than words how well this teacher's patience paid off.

Students engaged with 3-dimensional Tic-Tac-Toe.

The pupils listed on the pretest and posttest pages are those who were in the program from its inception. There were others who came in after the program started or who transferred out of the school before the posttest. They were not listed. Average class size was always about 30 pupils. I mention this only to point out the difficulty in getting definitive answers with a group of highly mobile pupils.

There was no aide assigned to the program. Once in a while, the teacher was able to borrow an aide, or an interested teacher in preparation period would lend a hand.

The activities used were taken from many different sources--anywhere we say an activity that we thought would be interesting and relevant. Many of them were taken from Math Shop, Encyclopedia Britannica. Sample sheets make up the next four pages.

A calendar is a pattern of numbers.

You can use arrows (→↓) to tell about days and weeks.
Tomorrow is →.
Yesterday was ←.
One week from today is ↓.
A week ago was ↑.

Today is Tuesday the 15th.
Then 15 → = 16 and 15 ↓ = 22.

SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

1 What is 22 → ? _____

2 What is 22 ← ? _____

3 What is 16 →↑ ? _____

4 What is 8←←↓? _____

5 Follow the moves given to complete the table below.

Starting date	Moves	Ending date
17	↑ ← ← ↑	
13	↓ → ↓ →	
11	↓ → ↑ ←	
25	→ ↑ ← ↑	
8	↓ → ← ← → ↓	
24	↑ ↑ ← ← ← ←	
2	↓ ← → ↑ → ←	
20	→ → ↑ ↑ ↓ ↓ ↑	

6 Does 17 →↑ = 17 ↑→ ? _____

7 Does the order of the arrows make a difference in the answer? _____

8 What is 4 →← ? _____

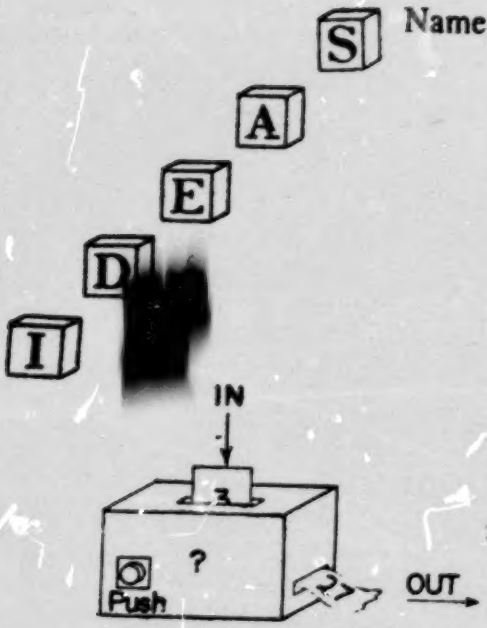
9 Do → and ← give the number you started with? _____

10 What is 9↑↓ ? _____

11 Do ↑ and ↓ give the number you started with? _____

© 1971 Scott, Foresman and Company

Name _____



Study the table and complete the entries.

A.

IN	3	3	4	5	6	7	10
Push	1	2	2	2	2	2	2
OUT	3	9	16	25			

B.

IN	2	2	2	2	2	2	2
Push	1	2	3	4	5	6	7
OUT	2	4	8				

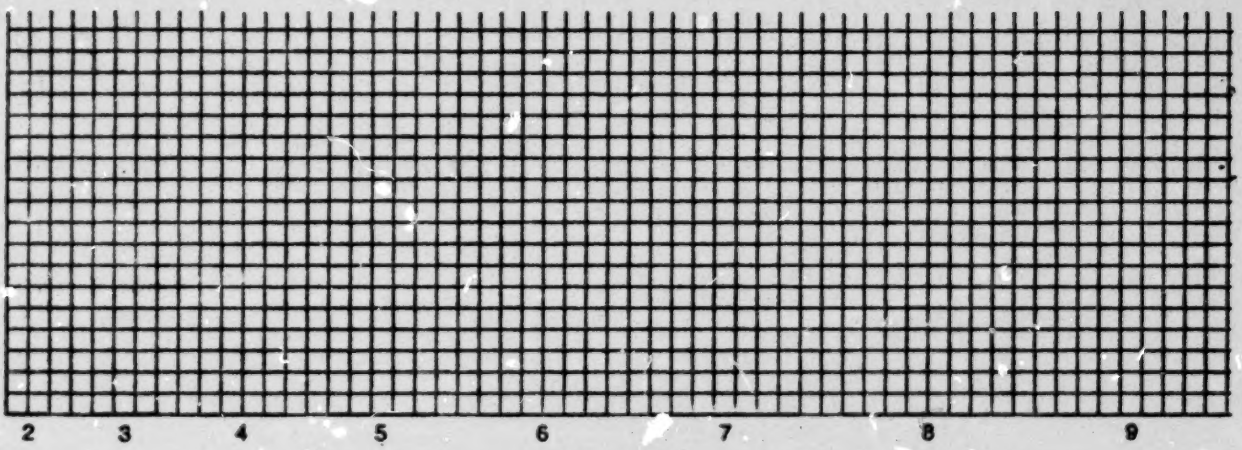
C.

IN	3	3	3	3	5	5	5
Push	2	3	4	5	2	3	4
OUT	9	27			25		

The dog pen

A rectangular dog pen
is to have a perimeter of 36 feet.
What are some sizes the pen could be
if you use 36 feet of fence?

Draw several pens on the grid below. Draw pens
with widths that are 2, 3, 4, 5, 6, 7, 8, and 9 squares.
Be sure that the perimeter of each one is 36.
Parts of the pens are already drawn for you.

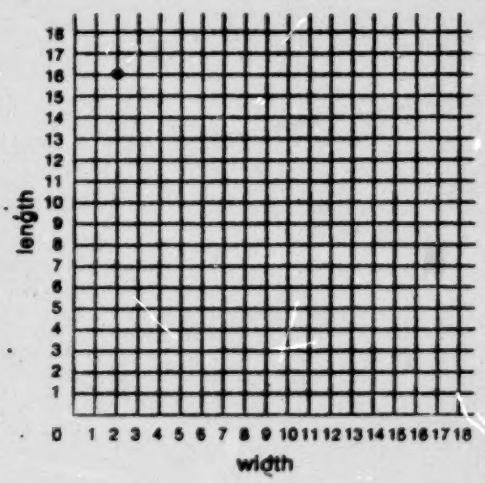


1 Record the width and length of each pen in table 1.

Table 1

Width	Length
2	16
3	
4	
5	
6	
7	
8	
9	

2 Graph the ordered pairs (width, length) from table 1 onto the grid below.
The first one is done for you.



© 1971 Scott, Foresman and Company

STATEMENT OF ACCOUNT

DAVIS, JERRY
236 Maple Street
Wynne, Arkansas Sample

CHECKS	DEPOSITS	DATE	NO. OF CHECKS PAID	BALANCE
BALANCE BROUGHT FORWARD →	$ 395.45	11-1-66		
23.49-		11-2-66	1	
7.83- 2.93-		11-5-66	3	
121.23-	101.01+	11-8-66	4	
40.00-		11-11-66	5	
12.49- 7.85-		11-15-66	7	
79.38-	240.38+	11-18-66	8	
32.45- 16.34-		11-19-66	10	
11.23-		11-20-66	11	
236.79-		11-23-66	12	
78.34-		11-24-66	13	
4.46-		11-26-66	14	
38.39- 2.98-		11-28-66	16	
	240.38	11-30-66		

Find the Balance at the close of each day.

NUMBER CHECKS	ITEM CHARGE	EXCHANGE	MAINTENANCE COST	TOTAL	MINIMUM BALANCE CREDIT	SERVICE CHARGE

SERVICE CHARGE CALCULATION

The first National Bank

• WYNNE, ARKANSAS

THE ONLY NATIONAL BANK IN CROSS COUNTY

CODE		
LS - LIST OF CHECKS	DC - DEPOSIT CORRECTED	EC - ERROR CORRECTED
RT - RETURNED ITEM	OD - OVERDRAFT	MS - MISCELLANEOUS
	SC - SERVICE CHARGE	

PLEASE EXAMINE AT ONCE. IF NO ERROR IS REPORTED IN 10 DAYS THE ACCOUNT WILL BE CONSIDERED CORRECT. ALL ITEMS CREDITED SUBJECT TO FINAL PAYMENT.

Evaluation

Since the mathematics applications program (MMM) was only a small part of the over-all mathematics program for the classes involved, the posttest scores shown on page 109, will not be helpful in evaluating our portion of the program. But when pupils have been in school for 7-9 years, and their average score is about 3.5, that means that their mathematical growth has been at the average rate of ½ year for each year in school. Many of our project pupils exhibited more than one half year of growth and we feel that our program is partly responsible. Where the pupils posttest scores were lower than the pretest, we assumed there had been a great deal of guessing on one or both of them.

Both the regular mathematics teacher and the project teacher, feel that:

1. Many of the pupils exhibit increased ability to attack mathematical problems.
2. Pupils are more secure in finding their own answers to questions.
3. Pupils are better able to verbalize and generalize.
4. Pupils are able to use calculators with some degree of skill.

The regular mathematics teacher, the project teacher and the principal feel that it is a program that should be perpetuated and extended, and it should have a multiplier effect on other schools in the district. (They have been invited in to

see it.) Intermediate School 139 plans to make it part of their regular school program (see letter, page 122).

Recommendations

- Programs should start at the start of the school year. Change in routine very upsetting to some pupils
- For maximum effectiveness, there should not be more than 15 students in a group.
- Games should be used only when they have a definite role to play and pupils should be aware that the games are functioning as mathematics tools.
- In setting up a program for unmotivated pupils, don't rule out the highly motivational potential of machines, calculating and otherwise. Even persons who feel that the slight gain in achievement does not justify the cost, will admit that even very restless pupils got down to work when they entered the project room.
- Most important of all is the teacher. There can be no special program without a very special teacher who sincerely believes in its merit.

BOARD OF EDUCATION — COMMUNITY SCHOOL BOARD 7
ALEXANDER BURGER I.S. 139 BRONX
345 BROOK AVENUE
BRONX, N. Y. 10454
PRINCIPAL
JOHN M. QUINN
TEL. 665-5445

ASSISTANT PRINCIPALS
IRVING KOHN
MORRIS SCHWARTZ
SHELDON RATHMAN
MARCELINO RODRIGUEZ, Acts.
SARAH E. SHELTON, Acts.

COMMUNITY SUPERINTENDENT
CARMEN RODRIGUEZ
COMMUNITY SCHOOL BOARD
PRES. — EUFEMIO MARRERO
SCHOOL REP. — IONA EDWARDS

May 30, 1973

Ms. Mary Teshara
Office of School District 12
708 Tremont Avenue
Bronx, New York 10457

Dear Ms. Teshara,

The pupils of 7-211, 7-316, 7-320, 7-328, their math teachers and Mrs. Pochoda wish to thank you for your part in planning and implementing our special math program, Motivating Mathematics Mechanically. The program has been and continues to be a positive thrust in our overall mathematics program.

We are now trying to devise ways of extending the program so that more pupils might benefit from this approach. We look forward to your indispensable help in this follow-up program.

Sincerely yours,

John M. Quinn
Principal

JMQ:mwl

BIBLIOGRAPHY

Barson, Alan. "The Mathematics Laboratory for the Elementary and Middle School." The Arithmetic Teacher, Dec., 71.

Broussard, Vernon; Fields, Albert; Reusswig, James M. "A Comprehensive Mathematics Program." A V Instruction, February, 69.

Cech, Joseph P. "The Effects of the Use of Desk Calculators on Attitude and Achievement with low Achieving Ninth Graders." The Mathematics Teacher, February, 72.

Fitzgerald, Wm. M. "About Mathematics Laboratories." (Michigan State University, Lansing, Mich.) Research Paper.

Gordon, C. Wayne. "Preliminary Evaluation Report on the Los Angeles Demonstration Program in Mathematics." Working Paper, 69.

Higgins, Jon L. "Attitude Changes In A Mathematics Laboratory Utilizing A Mathematics-Through-Science Approach." Journal for Research in Mathematics Education, Jan. 70.

Holt, John. How Children Fail. Pitman Publishing Co. New York, 1964.

Horowitz, Ronald S. "Teaching Mathematics to Students with Learning Disabilities." Academic Therapy, Fall, 1970.

Howard, Vivian G. "Teaching Mathematics to the Culturally Deprived and Academically Retarded Rural Child." Dis. Abstract. July, 70.

Howell, Daisy. "Project SOSO (Save Our Slow Ones)." The Arithmetic Teacher. January, 72.

Jones, Thomas. "The Effect of a Modified Program of Lectures and Games on Achievement and Attitudes of Ninth Grade Low Achievers in Mathematics." The Mathematics Teacher, Oct. 68.

Retzer, Kenneth A. "Effects of Precise Verbalization of Discovered Mathematics Generalizations on Transfer." Investigations in Mathematics Education, Oct. 70.

Reys, Robert E. "Considerations for Teachers Using Manipulative Materials." The Arithmetic Teacher, Dec. 71.

Romberg, Thomas A. "Current Research in Mathematics Education." Review of Educational Research. Oct. 69.

Travers, Kenneth J.; LeDuc, John W.; Runion, Garth E. "Teaching Resources for Low Achieving Mathematics Classes." ERIC Information Analysis Center for Science and Mathematics Education. Jul. 71.

Vance, James H.; Kiernan, Thomas E. "Laboratory Settings In Mathematics: What Does Research Say to the Teacher?" The Arithmetic Teacher. December, 71.